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IMPLICIT PARTNER EVALUATIONS

How They Form and Affect Close Relationships

RUDDY FAURE

Implicit Partner Evaluations: How They Form and Affect Close Relationships

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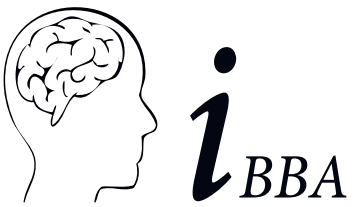

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Implicit Partner Evaluations:
How They Form and Affect Close Relationships

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Chapter 1

General Introduction

In the past few decades, relationship science has emerged as a multi-disciplinary and mature research field (Berscheid, 1999; Reis, 2007). Ever since, theory and empirical research on couple functioning has expanded sharply, generating a wide array of core principles and findings that aim to understand, predict, and improve relationship functioning (Finkel et al., 2017). This surge of research is not surprising; in fact, relationships have far-reaching implications in our societies—people who are satisfied with their long-term romantic partner are happier (Proulx et al., 2007), remain healthier (Robles et al., 2014), and live longer (Sbarra et al., 2011).

What is more surprising, however, is that traditional research on couples is dominated by an extreme reliance on self-report measures. Consequently, most of the studies that have examined the factors that may either strengthen or weaken the bond between partners have primarily centered on the role of deliberate processes; that is, the cognitions and feelings that people are able and willing to report in questionnaires about their relationship. But are people *really* aware of all the characteristics of their relationship? And do they *readily* report the undesirable aspects of it? Research indicates they do not (Fincham & Osborne, 1995) and these limitations appear to restrict the understanding and the predictability of relational well-being (Joel et al., 2020).

Only recently, research in relationship science has started to recognize and examine the role of automatic processes in close relationships (see Hicks & McNulty, 2019). Notably, relationship researchers have incorporated indirect measurements from implicit social cognition (the so-called '*implicit measures*') that are capable to capture people's automatic affective reactions, or 'gut-feeling', toward their partner. In recent years, research using such tools has grown and showed that *implicit partner evaluations*, as assessed by implicit measures, can predict later relationship satisfaction and stability, above and beyond self-report (McNulty et al., 2013).

Nevertheless, little is known about the sources of these implicit partner evaluations and the reasons why they have such substantial implications for long-term relationship outcomes. The main goal of the present dissertation is to address these issues and highlight the role of implicit partner evaluations in everyday life by focusing on three subgoals. Specifically, across seven chapters, this dissertation integrates research in relationship science and implicit social cognition to (a) examine how implicit partner evaluations form in daily relationship contexts (Chapter 2), (b) investigate how implicit partner evaluations affect relationship functioning over the course of time (Chapters 3 to 5), and (c) illustrate how such integrative approach can further benefit basic implicit social cognition research and contribute to solving societal issues (Chapter 6). Below, this first chapter will lay the foundation of this dissertation by describing frameworks and evidence from relationship science relative to how people make evaluative judgments in their relationship, then explaining how theories and methods derived from implicit social cognition research can invigorate the study of interpersonal relations, and finally reviewing work that integrates these two fields of research. Last, Chapter 7 will summarize the empirical findings described in this dissertation, discuss the implications of these findings for research in relationship science and in implicit social cognition, and provide directions for future research.

CLOSE RELATIONSHIPS: FUNCTIONS, EVALUATIONS, AND MOTIVATIONAL BIASES

Social relations, and romantic relationships in particular, are essential to our lives (Holt-Lunstad et al., 2010). Perhaps most notably, satisfying partnerships are reliably and positively associated with professional success (Finkel et al., 2014), goal performance (Fitzsimons et al., 2015), well-being (Proulx et al., 2007), health (Kiecolt-Glaser & Newton, 2001; Miller et al., 2013; Robles et al., 2014), and longevity (Stavrova, 2019). But remaining satisfied with a long-term romantic partner is notoriously difficult. Indeed, although there is considerable variability in the extent to which partners are able to remain satisfied over the years (Lavner & Bradbury, 2010), people generally experience a decline in relationship satisfaction as time goes by (Finkel et al., 2014; Meltzer et al., 2014). And, in most industrialized societies, almost half of marriages end now in divorce (Amato & James, 2010; Eurostat, 2020; Schoen & Canudas-Romo, 2006).

These trends pose serious societal challenges because romantic disruption has the power to create severe turmoil for both children and adults (Amato, 2000). As illustrative examples, not only do unhappy couples show poor immune system functioning (Kiecolt-Glaser et al., 1987), high blood pressure (Holt-Lunstad et al., 2008), and higher risks for developing mental problems (Pietromonaco & Collins, 2017), but relationship dissolution is also a strong predictor of suicide (Kazan et al., 2016) and early mortality risks (Sbarra et al., 2011). Of course, several mechanisms likely explain the association between relationships and health (Robles & Kiecolt-Glaser, 2003), but many appear to stem directly from one's level of relationship satisfaction, which is assumed to trigger a cascade of processes that can affect one's health (Robles, 2014).

Relationship satisfaction can be conceptualized as an evaluative judgment to determine whether people's relationship sufficiently meets their needs. According to Interdependence Theory (Kelley & Thibaut, 1978), the predominant framework on how people evaluate their relationships, people form such judgments by comparing the overall ratio of positive (i.e., rewards) versus negative (i.e., costs) relationship experiences against their relationship standards (i.e., what they expect from their relationship and how well they think they could do with alternative partners). That being said, there is abundant evidence showing that when people are asked to report on their relationship satisfaction, they frequently do so in a rather biased manner (for reviews, see Fletcher & Kerr, 2010; Gagné & Lydon, 2004; Murray, 1999). Indeed, people are strongly motivated to think about their partner (Murray et al., 1996a) and their relationships (Rusbult et al., 2000) in an overly positive light, because such idealized views provides people with an important sense of safety and control in their pursuit of belonging (Murray & Holmes, 2017). Yet, there are times in which even the most satisfying relationships disappoint. That is, although people experience a great deal of rewards, they also encounter inevitable costs over the course of their relationships (see Gable & Reis, 2001; Holt-Lunstad & Uchino, 2019; Overall & McNulty, 2017), as increased commitment necessitates that intimates endure unpleasant events, such as conflicts (Braiker

& Kelley, 1979), divergent interests (Righetti et al., 2016), rejections (Murray et al., 2006), and thwarted autonomy needs (Deci & Ryan, 2014).

How do people reconcile the fact that their partner is a stable source of negative affect with their strong motivation to see that partner positively? Research in close relationships indicates that people engage in deliberate reasoning that allows them to reject such negativity (e.g., Frye & Karney, 2002; Karney & Frye, 2002; Luchies et al., 2013). For instance, people commonly deemphasize the negative aspects of their relationship (McNulty & Karney, 2001), reinterpret prior negative events in ways that favor positive interpretations (Murray & Holmes, 1994), or transform their partner's faults into virtues (Murray & Holmes, 1993), all in ways to maintain positive relationship evaluations. And these motivational biases are stronger than many may realize. Indeed, not only do people report that their relationship is better than others (Rusbult et al., 2000), they also see their partner even more positively than their partner see themselves (Murray et al., 1996a), which is considerably impressive considering that one's self-evaluation is already highly skewed toward positivity (Hoorens, 1993; S. E. Taylor & Brown, 1988).

Granted, at times, seeing imperfect partners in idealized ways can benefit couples through a variety of self-fulfilling effects (Murray, Griffin, et al., 2011), including elevated relationship security (Murray & Holmes, 1997) and persistence (Murray et al., 1996b). At other times, however, these positive illusions can be considerably detrimental. Indeed, there are negative aspects that cannot be explained away forever. While motivated reasoning allows people to deny these aspects with the creation of positive narratives, such negativity does not simply disappear. Instead, it leaves people vulnerable to a possible resurfacing of their lingering feelings during future encounters with the partner (see Murray & Holmes, 1993). Although little is known about how such feelings may resurface, the high rates of divorce combined with the frequent declines in relationship satisfaction suggest that they do and likely affect the way partners behave toward each other.

This perspective is consistent with the notion that intimates regularly interact in ways that are routinized (Rusbult & Van Lange, 1996) and that the more or less spontaneous behavioral patterns that occur between partners may often stem from deep-rooted associations and affect that people may not always endorse or even realize (Fincham & Osborne, 1995). Given that the way partners respond to one another is critical to relationship functioning (Rusbult & Van Lange, 2003), studying these lingering feelings may be key to explain why some couples become less satisfied than others over time. To date, however, relationship researchers have overwhelmingly relied on self-report measures that too often fail to capture such automatic processes. And because self-report measures are highly susceptible to motivational biases, recent large-scale investigations indicate they jeopardize our ability to understand and predict relationship initiation (Joel et al., 2017) and change in relationship satisfaction over time (Joel et al., 2020). In light of these findings, Fincham and Osborne (1995) were early and yet right to summon relationship researchers to incorporate paradigms and theories from implicit social cognition that would enable them to capture and explain the role automatic processes in relationships, and to add that "Failure to do so will leave marital researchers with an incomplete picture of marriage" (p. 24).

IMPLICIT SOCIAL COGNITION: THE IMPLICIT-EXPLICIT DUALISM IN EVALUATIONS

The idea that people may not be able or willing to report their automatic affective reactions toward their partner resonates quite well with decades of research on attitudes in the field of implicit social cognition. Indeed, predominant theories on attitudes all posit that direct (e.g., personal interactions) and indirect (e.g., media exposure) experiences, whether they are positive or negative, are automatically etched in memory and stored as mental representations (e.g., Baldwin, 1992; Cacioppo & Berntson, 1994; Fazio, 2000; Gawronski & Bodenhausen, 2006). These mental representations take the form of automatic evaluative associations between a target and one's evaluation of that target (i.e., target-positive/negative), the sum of which represent one's automatic attitude toward the target (Fazio, 2007). Like in close relationships, however, people often fail to report such attitude (Strack & Deutsch, 2004; Wilson et al., 2000), either because its mental content is difficult to access via *introspection* (Greenwald & Banaji, 1995), or because they are *motivated* to disguise their responses in ways that are personally acceptable and socially desirable (Gawronski & Strack, 2004). These challenges have inspired the development of novel paradigms capable to bypass these limitations and capture people's automatic attitudes.

Measurement Instruments

Over the last three decades, social cognitive researchers have developed and validated a number of indirect measurement tools to assess these automatic attitudes (for reviews, see De Houwer et al., 2009; Gawronski & Brannon, 2019; Nosek et al., 2011). Indirect measurements, often referred to as implicit measures, take the form of performance-based measures in which participants perform seemingly neutral computerized tasks under time pressure. Although these tasks may vary from one implicit measure to another, they generally fall into one of the three following types: *speeded categorization tasks*, where people have to categorize target stimuli in a manner that is either congruent (e.g., partner-positive) or incongruent (e.g., partner-negative) such as in the Implicit Association Test (Greenwald et al., 1998) and its variants (e.g., Single Category-IAT; (Karpinski & Steinman, 2006); *evaluative priming procedures*, in which people evaluate target stimuli following the brief presentation of a prime (e.g., photo of the partner) as in the Evaluative Priming Task (Fazio et al., 1986, 1995) and the Affect Misattribution Procedure (Payne et al., 2005); and *signal detection tasks*, where people must complete certain actions that are either congruent (e.g., approaching partner stimuli) or incongruent (e.g., avoiding partner stimuli) such as in the Go/No-Go Association Task (Nosek & Banaji, 2001) and the Approach-Avoidance Task (Chen & Bargh, 1999).

Accordingly, a central feature of implicit measures is that evaluative responses are inferred from objective performance indicators, such as one's speed or accuracy in responding to attitudinal stimuli. In contrast, evaluative responses on direct measurements, often referred to as explicit measures, are inferred from subjective indicators, such as one's

self-reported liking of attitudinal stimuli in a questionnaire. Based on these characteristics, implicit measures appear more suitable to assess the spontaneous attitudes that participants are either unwilling or unable to report because (a) participants remain relatively oblivious regarding the purpose of the task, (b) responses on the task do not require introspection from the participant, and (c) responses on the task are difficult to control. Consistent with the idea that they considerably reduce the impact of motivational biases, several meta-analyses indeed show that, on average, implicit evaluations as assessed by performance-based measures are only weakly associated with self-reported explicit evaluations (Cameron et al., 2012; Greenwald et al., 2009; Hofmann, Gawronski, et al., 2005) and seem to tap onto related yet somewhat different constructs (Bar-Anan & Vianello, 2018).[1]

Attitude Formation and Change

A large body of research in implicit social cognition has sought to examine how implicit vs. explicit evaluations form and update in an effort to better understand the source of their apparent discrepancy. One of the predominant dual-process theories of attitude formation and change, the Associative-Propositional Evaluation (APE) model (Gawronski & Bodenhausen, 2006), posits that implicit and explicit evaluations are the behavioral outcomes of two different underlying processes; associative and propositional, respectively. More specifically, implicit evaluations are assumed to reflect the activation of associations in memory (associative process), which is primarily guided by principles of learning by similarity and contiguity. In contrast, explicit evaluations are assumed to reflect the deliberate validation (or rejection) of temporarily activated information (propositional process), which is guided by the principle of cognitive consistency.

From this perspective, the APE model identifies specific cases where change in either one or both implicit and explicit evaluations may occur, and the evidence amassed thus far largely support its predictions (for a review, see (Gawronski & Bodenhausen, 2011). That is, several studies demonstrated change in implicit evaluations when newly formed associations were sufficiently strong to alter the pre-existing structure of associations in memory, which was generally achieved slowly and gradually through the repeated exposure to new information (e.g., Olson & Fazio, 2006; Rydell et al., 2007) but also quite rapidly when the new information was highly powerful and diagnostic (e.g., Cone & Ferguson, 2015; Ferguson et al., 2019). Conversely, change in explicit evaluations was found to occur whenever a new proposition was accepted a valid source of information (e.g., Gawronski & LeBel, 2008; Gregg et al., 2006).

1 In the attitude literature, several terminologies can be found to refer to implicit evaluations (e.g., automatic, associative, impulsive) and explicit evaluations (e.g., controlled, deliberate, reflective), each of which being sometimes used in different ways, such as for example to refer to distinct attitudes (e.g., Greenwald & Banaji, 1995), measurements (e.g., Fazio, 2007), underlying processes (e.g., De Houwer et al., 2009), or evaluative responses (e.g., Gawronski & Bodenhausen, 2011). Throughout this dissertation, implicit and explicit evaluations are used to refer to two different *evaluative responses* while remaining rather cautious and agnostic about the nature of their representations and underlying processes. That is, implicit evaluations are used when the evaluative connotation of the response is implicit (e.g., inferred from one's reaction time to partner-related stimuli), and explicit evaluations are used when the evaluative connotation of the response is explicit (e.g., inferred from one's self-reported liking of their partner).

Attitude-Behavior Relationship

An important reason why socio-cognitive researchers have sought to measure and understand the nature of automatic attitudes is because one primary function of such attitudes is to guide behavior and help individuals navigating their social interactions (Cacioppo & Berntson, 1994; Fazio, 2000). In this regard, dual-process theories from implicit social cognition research can help explain under which conditions implicit vs. explicit evaluations predict behavior. Notably, the *M*otivation and *O*pportunity as *DE*terminants (MODE) model (Fazio, 1990), the predominant model on the attitude-behavior link, postulates that one's automatic attitudes toward a target, such as those assessed by implicit measures, become automatically activated upon the encounter or the imagination of that target (Fazio et al., 1986). Once activated, and especially when strong (Fazio, 2007), these attitudes determine attention, construal and behavior, all in an automatic manner (i.e., unintentionally, effortlessly, efficiently, and largely outside of awareness; Bargh, 1994). However, if people are willing (i.e., high motivation) and able (i.e., high opportunity) to engage in effortful deliberate reasoning, they may decide to override these automatic responses with more controlled responses that align with other, more explicit, cognitions and goals.

Supporting evidence in favor of this model indeed suggests that implicit evaluations are more predictive of behavior under conditions that foster automatic responding (i.e., low motivation and/or opportunity), whereas explicit evaluations guide behavior in situations that favor more controlled responding (i.e., high motivation and opportunity) (see Fazio & Olson, 2014; Friese et al., 2008; Hofmann, Friese, et al., 2008; Kurdi et al., 2019; Perugini et al., 2010). For instance, and consistent with assumptions derived from the MODE model, research indicates that implicit (vs. explicit) evaluations predict (a) the *types of behavior* that are difficult (vs. easy) to control (e.g., nonverbal vs. verbal behavior; Dovidio et al., 2002), (b) behavior in *situations when* contextual factors restrict (vs. not) the opportunity to deliberate (e.g., high vs. low cognitive load; Hofmann, Gschwendner, Castelli, et al., 2008), or (c) behavior *for people* who are less (vs. more) capable of engaging in such deliberate processing (e.g., low vs. high working memory capacity; Hofmann, Gschwendner, Friese, et al., 2008).

BRIDGING RELATIONSHIP SCIENCE AND IMPLICIT SOCIAL COGNITION

Over the years, theories and measurements from implicit social cognition research have been applied to a large variety of domains. Indeed, while being originally introduced to investigate racial stereotypes and self-esteem (Greenwald & Banaji, 1995), implicit measures have now gained substantial popularity in psychological sciences and have proven useful to the study of attitudes that are critical to real-life behaviors but for which people may either lack introspection or be tempted to fake their responses, such as toward gender stereotypes (Nosek et al., 2009), political ideologies (Arcuri et al., 2008), academic persistence (Roland

et al., 2018), unhealthy food preference (Hofmann, Gschwendner, Friese, et al., 2008), substance use (Serra et al., 2019), dangerous behaviors (Lannoy et al., 2020), deviant sexual interests (Babchishin et al., 2013), and suicidal ideations (Tello et al., 2020). In this regard, close relationships are no exception; in fact, they may even provide a unique opportunity to invigorate basic implicit social cognition research by studying strong attitudes that are formed through ongoing contact with significant others and that may regularly affect the functioning of relationships that have a crucial impact on people's health and well-being.

Implicitly Measured Partner Evaluations

Fincham and colleagues (1995) were the first to examine the role of automatic processes in close relationships by showing that mental accessibility of evaluative judgments about the partner, as indexed by reaction time, determined the extent to which such judgments predicted relationship expectations. Ever since, and most notably in the last decade, relationship science has seen a rise of studies that have taken inspiration from the indirect measurements developed in the field of implicit social cognition (for reviews, see Baldwin et al., 2010; Banse & Imhoff, 2013; Hicks & McNulty, 2019; McNulty & Olson, 2015). Consistent with the idea that implicit measures capture information that may often be missed by more motivationally biased explicit measures (Hofmann, Gschwendner, et al., 2005), this work indicates that implicit and explicit measures of partner evaluations tend to be weakly associated with one another (Hicks et al., 2020; Scinta & Gable, 2007). In a notable example, Hicks and colleagues (2020) conducted a meta-analysis of the literature incorporating such measures (k = 23 samples from 3,557 romantic partners resulting in 86 zero-order correlations), which revealed a small yet significant positive association between implicit and explicit partner evaluations (r = .04, 95% CI [0.02, 0.06]).

Implicit Partner Evaluations: Antecedents

The fact that implicit and explicit partner evaluations are only weakly associated with one another suggests that these two types of evaluations may register and reveal different types of information in the relationship. Drawing upon the APE model (Gawronski & Bodenhausen, 2006), implicit measures of partner evaluations should better reflect the accumulation of pleasant *and* unpleasant experiences that people have repeatedly encountered with their partner over the course of their relationship and that gradually became associated with that partner in memory as evaluative associations (i.e., partner-positive/negative). Conversely, because people may often decide to reject some experiences as a valid source of information to evaluate their partner, especially when those are unpleasant, explicit measures likely mirror the motivational processes through which people make sense of their romantic realities.

Consistent with this view, recent work indicates that, on average, implicit measures of partner evaluations indeed demonstrate both positive *and* negative evaluative associations toward the partner, whereas explicit evaluations demonstrate high positivity and low

negativity (McNulty et al., 2019; Zayas & Shoda, 2015; Zayas et al., 2017). And a few other studies further suggest that the extent to which implicit partner evaluations contain positivity and negativity seems to reflect the degree to which people have experienced pleasant (Hicks et al., 2016, 2018; McNulty et al., 2017) and unpleasant (Banse et al., 2013; Banse & Kowalick, 2007; Murray et al., 2010) affect with their partner, even when such affect—whether be positive or negative—appears to be rejected at the explicit level (see Hicks et al., 2016, 2018; Murray et al., 2010). Yet, crucially, it remains unknown how implicit vs. explicit partner evaluations fluctuate and update in response to the many relationship experiences that partners encounter over time.

Implicit Partner Evaluations: Consequences

Of critical importance, the fact that implicit partner evaluations may encapsulate the affective and mental constructs that people develop throughout their relationship suggests they may have substantial implications down the line. And recent research in close relationships indicates they do. Indeed, several studies showed that implicit partner evaluations predicted later relationship satisfaction (LeBel & Campbell, 2009; McNulty et al., 2013, 2017; Scinta & Gable, 2007) and later risks of break-up (LeBel & Campbell, 2009; Lee et al., 2010) over and above explicit evaluations. In one notable example, McNulty and colleagues (2013) found that more negative implicit partner evaluations at baseline predicted steeper declines in newlyweds' marital satisfaction over the course of four years, whereas baseline explicit evaluations did not. And given their impact on relationship satisfaction, LeBel and Campbell (2009) showed that, in turn, more negative implicit partner evaluations were indirectly associated with later relationship dissolution.

Although the evidence amassed thus far clearly indicates that implicit partner evaluations have substantial implications for both relationship quality and stability over time, questions remain regarding the reasons why they have such long-term consequences and how exactly they shape these outcomes in everyday life. According to the MODE model (Fazio, 1990), one possible explanation may be that implicit partner evaluations are automatically activated whenever people encounter or imagine their partner, which seems to be the case in close relationships (Banse, 1999), and, once activated, to determine perception and behavior toward the partner, especially when one's ability to deliberate is reduced. Consistently, a few studies suggest that people with more positive implicit partner evaluations formulate more favorable interpretations of their relationship problems (McNulty et al., 2013) and report more communal behaviors enacted toward their partner (LeBel & Campbell, 2013), especially for those with low working memory capacity (Murray, Pinkus, et al., 2011; Murray et al., 2012; Murray, Gomillion, et al., 2013). Although encouraging, these findings remain limited in number and scope, and further research is needed to identify under which conditions implicit partner evaluations may affect maintenance processes that are critical to well-functioning and satisfying relationships.

THE PRESENT DISSERTATION

The literature reviewed in this first chapter indicates that relationship science stands to benefit from integrating dual-process theories and measurement tools from implicit social cognition into the study of close relationships. In fact, research focusing on automatic processes in relationship contexts has shown that implicit partner evaluations have important long-term implications for relationship well-being. To date, however, key questions remain about the sources of these implicit partner evaluations and the reasons why they predict later relationship outcomes. The goal of this dissertation is to contribute to this body of work by providing novel insights into the role of implicit partner evaluations in everyday life and by illustrating how basic implicit social cognition research may also benefit from such focus. Specifically, the present dissertation has three subgoals. The first is to investigate how implicit partner evaluations form in close relationships by examining how they fluctuate and update in response to relationship experiences encountered with the partner in daily life (Chapter 2). The second subgoal is to determine whether and under which conditions implicit partner evaluations influence daily relationship-maintenance processes that are critical to well-functioning and satisfying relationships, such as nonverbal communication (Chapter 3), forgiveness (Chapter 4), and behavioral efforts to improve the relationship (Chapter 5). Finally, the third and last subgoal of this dissertation is to describe how studying automatic processes in close relationships contexts can invigorate implicit social cognition research on attitudes and provide insights with practical implications (Chapter 6). This dissertation is built on four empirical chapters (Chapters 2, 3, 4, and 5) and one review chapter (Chapter 6). Each of these five chapters represents an independent research article that has either been published or submitted for publication. Because they are the result of collaborative work, I chose to use "we" instead of "I" throughout these chapters. Below I provide an overview of the six chapters that constitute the remainder of this dissertation.

Chapter 2 begins with examining the question of how implicit partner evaluations form and update in response to daily relationship experiences encountered in the laboratory and in the field. In fact, evidence documenting whether and how implicit vs. explicit partner evaluations fluctuate and update over time in a relationship is scarce. To address this question, we examined temporary changes in implicit and explicit partner evaluations from both members of romantic couples after discussing a situation of divergence of interests in a videotaped interaction study (Study 2.1) and after reporting on several relationship experiences in a 14-day diary study (Study 2.2). Results revealed that, compared to explicit evaluations, implicit partner evaluations (a) remained more stable over a two-week period, (b) had a weaker association with same-day relationship experiences, (c) covaried more strongly with the aggregation of repeated relationship experiences encountered over the course of two weeks, and (d) were as sensitive as explicit partner evaluations to highly diagnostic relationship experience, such as breakup.

Chapter 3 investigates one of the reasons why implicit partner evaluation predict subsequent relationship outcomes. Specifically, we examined what type of behaviors are influenced by implicit partner evaluations in dyadic interactions. Based on dual-process theories (Fazio, 1990), we reasoned that implicit partner evaluations are likely to affect behavioral responses that are more automatic and difficult to control, such as nonverbal cues (DePaulo, 1992). Because nonverbal communication fulfills crucial functions in intimate relations (Noller, 2006), we proposed that nonverbal behavior would be responsible for the effect of implicit partner evaluations on later relational outcomes. Consistently, results showed that more positive implicit partner evaluations predicted more constructive nonverbal behavior in a videotaped problem-solving conversation, and that this constructive nonverbal behavior, in turn, was associated with higher satisfaction with the outcome of the conversation and positive change in relationship satisfaction over the following week. Explicit evaluations, in contrast, did not predict behavior.

Chapter 4 examines other reasons why implicit partner have long-term implications in close relationships. In particular, this chapter reports two studies documenting under which conditions and for which individuals implicit partner evaluations predict interpersonal forgiveness—key to relationship maintenance (McCullough et al., 2000). Consistent with dual-process theories (Fazio, 1990), we predicted that under conditions of low executive control (i.e., reduced opportunity to deliberate), either as a state or as a trait, implicit partner evaluations would determine forgiveness. Results supported the idea that, when people's state executive control was undermined (vs. kept intact) by an experimental manipulation (Study 4.1) or for people with low (vs. high) trait executive control (Study 4.2), more positive implicit partner evaluations predicted more forgiveness toward the partner in laboratory settings and in an 8-day daily diary.

Chapter 5 seeks to further study the affective complexity that characterizes implicit partner evaluations. Research indicates that, on average, people show patterns of implicit ambivalence (i.e., they hold both positive *and* negative evaluative associations toward their partner), even in the absence of ambivalence at the explicit level (Zayas et al., 2017). According to literature attitudinal models of implicit social cognition (Petty et al., 2012), implicit ambivalence may function as a driving force to improve relationships because it should motivate people to solve the source of their ambivalence. Across two longitudinal studies of newlyweds, integrative data analyses revealed that higher implicit ambivalence was associated with higher motivation to make efforts to improve current marital problems, even after controlling for confounding variables. In turn, higher motivation predicted reduced severity of marital problems as perceived by the partner which, then, was associated with elevated marital satisfaction among both spouses.

Chapter 6 reviews the literature on implicit partner evaluations to describe how integrating research in implicit social cognition and in relationship science can benefit both fields. In this chapter, we argue that long-lasting questions and current controversies in the field of implicit social cognition stem, at least in part, from the contexts and methods used to study implicit evaluations. We propose close relationships as a fruitful avenue to

improve these limitations. Close relationships enable researchers to study strong attitudes in personally-meaningful contexts and to apply fined-grained longitudinal methods to gain novel insights regarding the nature of implicit evaluations, how they update in response to personal experience, and their implications for real-world behaviors. In addition, given the profound importance of close relationships for well-being, we postulate that applying implicit social cognition theories to close relationships can invigorate research on couples by enhancing our understanding of relationship functioning and by informing interventions that can efficiently help couples and reliably benefit society.

Chapter 7 concludes this dissertation. In this last chapter, I provide an extended overview of the empirical findings described in this dissertation, discuss the theoretical, methodological and practical implications of these findings for relationship science and implicit social cognition, consider the strengths and limitations of this program of research, and provide directions for future work.

Chapter 2

How Do Implicit and Explicit Partner Evaluations Update in Daily Life? Evidence From the Lab and the Field

This chapter is based on Larson, G.*, Faure, R.*, Righetti, F., & Hofmann, W. (2020). *How Do Implicit and Explicit Partner Evaluations Update in Daily Life? Evidence From the Lab and the Field* [Manuscript under revision]. Vrije Universiteit Amsterdam.

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ABSTRACT

Evidence suggesting that implicit partner evaluations (IPEs) but not explicit evaluations (EPEs) can predict later changes in satisfaction and relationship status has led researchers to postulate that IPEs must be especially sensitive to relational rewards and costs. However, supporting evidence for this assumption remains scarce and very little is known regarding how IPEs vs. EPEs actually update in everyday life. Two studies (one in-lab dyadic interaction study, $N = 255$, and one 14-day dyadic diary study, $N = 348$) investigated updating in IPEs and EPEs in the context of real-life relationship experiences. Study 1 revealed that the level of positive and negative experiences that a couple encountered while discussing a divergence of interests in their relationship predicted pre-to-post changes in EPEs, but not in IPEs. Study 2 revealed that IPEs showed less sensitivity to everyday relationship experiences across multiple metrics over the course of 14 days. Specifically, IPEs (vs. EPEs) fluctuated less at the within-person level, showed less-abrupt changes from day-to-day, and had a substantially weaker relationship with same-day positive and negative relationship experiences. Rather than covarying with same-day experiences, IPEs appeared sensitive to relationship experiences aggregated across multiple prior days as well as to highly diagnostic relationship experiences, such as breakup. Consistent with recent advances in social-cognitive research, these findings support a modified account of IPE sensitivity, according to which IPEs show only gradual shifts under everyday circumstances, but more-dramatic shifts under highly diagnostic circumstances. Implications of these findings for close relationships and implicit social cognition research are discussed.

Keywords: implicit and explicit partner evaluations, attitude updating, relationship experiences, close relationships, ecological validity

Recent work suggests that implicit evaluations of romantic partners—the automatic affective reactions toward one's partner—predict highly consequential relationship outcomes, such as later relationship satisfaction and stability, and often do so even more accurately than self-report evaluations (e.g., Lee et al., 2010; McNulty et al., 2013). However, while growing attention has been devoted to determining the long-term consequences of implicit partner evaluations, there has been much less focus on understanding their roots—that is, how these evaluations are shaped throughout daily interpersonal experiences. Yet, examining how implicit partner evaluations form in relational contexts is critical both for understanding why they forecast future relationship trajectory and for developing interventions that can help couples.

Interestingly, implicit partner evaluations are only weakly associated with explicit indicators of relationship satisfaction assessed at the same time point (Hicks et al., 2020; Scinta & Gable, 2007). This implies that people's implicit and explicit partner evaluations might be connected to one's past relationship experiences in diverging ways. One especially intriguing possibility is that these two types of evaluations might differ in their malleability and responsiveness to new information. Indeed, recent perspectives propose that implicit partner evaluations may function as an early indicator of distress in a relationship, in part because these evaluations sensitively register subtle positive and negative experiences that may be overlooked (due to cognitive limitations) or discounted (due to motivated beliefs) when forming explicit evaluations (Baldwin et al., 2010; Hicks & McNulty, 2019; McNulty & Olson, 2015). People are in fact strongly motivated to maintain overly positive views of their partner, even if the face of apparent flaws or offenses (Murray, 1999), suggesting that implicit partner evaluations may better capture relationship experiences that people may be unwilling or unable to report in questionnaires. However, existing research that tests this assumption is scarce. Consequently, fundamental questions regarding how implicit partner evaluations update over time remain unanswered—questions that are crucial to understanding why implicit and explicit partner evaluations differ from one another as well as to understanding the role that these two types of evaluations play in capturing relationship experiences and in predicting later relational outcomes.

In the present research we investigate three key questions related to the temporal dynamics of implicit partner evaluations in everyday life: Are implicit partner evaluations more (or less) malleable than explicit evaluations over time? Are implicit partner evaluations more (or less) closely linked than their explicit counterparts to day-to-day experiences of interactions like conflict, responsiveness, and sexual intimacy within one's relationship? And finally, are fluctuations in implicit partner evaluations closely tied to discrete daily experiences, or to the aggregation of experiences over time? To address these questions, we report findings from two methodologically complementary studies that assessed change in implicit vs. explicit evaluations in the context of real couple interactions: The first, an in-lab interaction study assessing pre-to-post changes in implicit and explicit partner evaluations following a problem-solving discussion, and the second, a two-week diary study tracking daily fluctuations in implicit and explicit partner evaluations, as well as a in a range of positive and negative relationship experiences.

Implicit Assessments of Partner Evaluations

Having a satisfying romantic relationship plays a major role in promoting psychological and physiological well-being (e.g., Finkel et al., 2014; Kiecolt-Glaser & Newton, 2001; Proulx et al., 2007) and in reducing mortality risk (Sbarra et al., 2011; Stavrova, 2019). However, remaining satisfied with a romantic partner is challenging. On average, couples experience steady declines in relationship satisfaction as time goes by (e.g., Lavner & Bradbury, 2010; McNulty et al., 2013; Meltzer et al., 2014), and in many Western industrialized countries, almost half of marriages now end in divorce (Amato & James,

2010; Eurostat, 2020). Given the profound importance of high-quality relationships for well-being, health, and longevity (Holt-Lunstad et al., 2008, 2010; Robles et al., 2014), a better understanding of the determinants of relationship evaluations is of both theoretical interest and practical relevance.

Historically, relationship researchers have relied predominately on explicit measures when probing the origins and consequences of relationship satisfaction (Finkel et al., 2017). Explicit reports, however, often reveal surprisingly little about long-term trajectories of relationship satisfaction (Joel et al., 2020; McNulty et al., 2013). One reason why self-report measures may miss signals of strength or weakness in a relationship is that they are vulnerable to several limitations, including partners' lack of accurate self-knowledge, limited memory capacity, and motivated misperceptions of their relationship (Crowne & Marlowe, 1960; Endo et al., 2000; Fletcher & Kerr, 2010; Murray, 1999). Indeed, romantic relationships are a domain in which individuals hold especially strong perceptual biases (McNulty & Karney, 2001), which may make them unwilling or unable to acknowledge what they spontaneously think and feel toward their partner (Hicks et al., 2020).

In an effort to circumvent these limitations, a wave of recent work has explored the possibility of assessing people's relationship-related attitudes indirectly, in ways that limit their ability to engage in deliberate control and motivated reasoning (LeBel & Campbell, 2009; Lee et al., 2010; McNulty et al., 2013, 2017; Murray et al., 2019; Scinta & Gable, 2007). Specifically, by using response-latency measures (Fazio et al., 1995; Greenwald et al., 1998) and misattribution paradigms (Nuttin, 1985; Payne et al., 2005), researchers aim to capture the spontaneous affective associations that spring up when participants think about or see their romantic partners—i.e., their implicit partner evaluations. Because they tap participants' automatic reactions and restrict their ability to control their responses, these implicit measures seem to reflect a construct that is related to yet distinct from explicit relationship-related self-reports (Fazio, 2007; Hicks et al., 2020; Nosek et al., 2011).

Crucially, implicit partner evaluations (IPEs), over and above explicit partner evaluations (EPEs), appear to have important implications for cognition and behavior in relationships (see Hicks & McNulty, 2019). For instance, more positive IPEs have been linked to fewer perceiving fewer marital problems (McNulty et al., 2013), perceiving less rejection (Murray et al., 2015) and making more positive attributions in the face of threats (Murray et al., 2012; Murray, Pinkus, et al., 2011). Similarly, people with more positive IPEs engage in more responsive, loving behavior in daily life (LeBel & Campbell, 2013) and exhibit more constructive nonverbal communication in problem-solving situations (Faure et al., 2018). Perhaps most strikingly, given their influences on cognition and behavior, longitudinal work has found IPEs to forecast later change in relationship satisfaction over time (Faure et al., 2018; Scinta & Gable, 2007), even when initial EPEs did not (McNulty et al., 2013), and later intentions to stay in a relationship (LeBel & Campbell, 2009; Lee et al., 2010). Further, IPEs have also been experimentally linked to interpersonal and intrapersonal well-being. That is, experimentally enhancing IPEs using an evaluative-conditioning paradigm led to improved marital satisfaction over eight weeks (McNulty et al., 2017) and to reduced suicidal ideations later on (McNulty et al., 2019).

Temporal Dynamics of Updating in Implicit and Explicit Evaluations

Nonetheless, it remains particularly intriguing that IPEs can foretell *later* explicit relationship outcomes while also being so weakly linked to *contemporaneous* explicit evaluations (Hicks et al., 2016, 2020; Lee et al., 2010; McNulty et al., 2013; Scinta & Gable, 2007). To address this puzzle, some work has started to examine the conditions under which implicit and explicit partner evaluations may temporarily become more closely aligned with one another (Hicks et al., 2020; Scinta & Gable, 2007). However, up until now, very little attention has been drawn to how implicit and explicit partner evaluations are updated in response to experiences within the relationship. If IPEs and EPEs updated symmetrically in response to daily relationship experiences, we would in fact expect these evaluations to be at least moderately correlated. Given that IPEs and EPEs are instead quite weakly associated, this raises the possibility that these evaluations show different patterns of revision in response to a person's relationship experiences over time.

And indeed, although this topic has received little consideration in relationship science, existing research within and outside of close relationships points to multiple possibilities for how IPEs and EPEs might differ in their dynamics of change. One the one hand, deliberate, motivated processes might ensure over-time consistency in EPEs, while less-regulated IPEs might shift flexibly in response to day-to-day changes in relationship experiences. Alternatively, other lines of work suggest that IPEs should reflect slow-changing processes and thus show less sensitivity to everyday relationship experiences compared to EPEs. In the remainder of this introduction, we first review existing literature on stability and updating in implicit evaluations of romantic partners. We then integrate these findings with evidence from the broader implicit social cognition literature, including evidence that supports the proposition that implicit evaluations (in general) should be more resistant to change, and evidence supporting the proposition that implicit evaluations are equally or more malleable relative to explicit evaluations.[2]

Evidence for Stability and Updating in Implicit Evaluations within Close Relationships

The existing literature on implicit partner evaluations has often suggested that IPEs (vs EPEs) may be more sensitive indicators of positive and negative experiences in the relationship (Baldwin et al., 2010; McNulty & Olson, 2015), perhaps especially very recent experiences (Hicks & McNulty, 2019). A central idea underpinning this perspective is that people's explicit evaluations of their romantic partners are heavily shaped by motivated biases, all aimed at perceiving the partner in an overly positive light (Bradbury & Fincham, 1990; Fletcher & Kerr, 2010; Gagné & Lydon, 2004; Murray, 1999). These (explicit) positive

2 In dividing the existing literature into these two groupings, we do not mean to imply that there are only two possible perspectives explaining how implicit vs. explicit evaluations are updated, nor that these frameworks are mutually exclusive. Instead, we believe that these conceptual frameworks may be complementary and that some existing work speaks to both. We distinguish them here in order to provide structure to our overview of relevant prior work and to develop clear contrasting predictions for the present research.

illusions and attributions often persist even in the face of partner's flaws or misbehavior, at least in the short term (Judith A. Hall & Taylor, 1976; MacDonald & Ross, 1999; Murray & Holmes, 1993), in part because this maintains confidence in the relationship despite the inevitable challenges encountered in interdependent contexts (Murray & Holmes, 1994).

This suggests that EPEs may be relatively untethered from daily ups and (especially) downs in the relationship. If maintaining positive impressions in the face of negative experiences requires deliberate cognition, then IPEs should be less affected by these biases than EPEs (Fazio & Olson, 2014; Gawronski & Bodenhausen, 2006; Kurdi & Banaji, 2019), and thus shift more flexibly as the positivity of interactions with a partner ebbs and flows. A small body of work is consistent with the premise that everyday experiences lead to updating in implicit evaluations (Zayas et al., 2017). For example, conflict with a romantic partner appears to be associated with more negative IPEs, but not EPEs, four years later (Murray et al., 2010). Similarly, frequency of sex was associated with changes in IPEs three years later, but unassociated with explicit relationship satisfaction (Hicks et al., 2016), except for people motivated to acknowledge the importance of sex for relationship quality (Hicks et al., 2018).

However, while this small set of studies provides preliminary evidence that implicit partner evaluations may be relatively sensitive to positive and negative interactions with a romantic partner, they cannot resolve the question of whether this sensitivity is grounded in rapid versus gradual shifts in IPEs. In fact, because this work has assessed implicit partner evaluations multiple years after the measurement of initial relationship experiences, these findings could also be consistent with the possibility that changes in IPEs unfold quite slowly. A handful of studies do suggest that IPEs adjust to reflect new interpersonal experiences across shorter time scales, e.g., weeks or months. For example, IPEs seem to shift over a period of 5 months across the transition to parenthood (Murray et al., 2019), and an evaluative conditioning paradigm produced changes in IPEs across six weeks (McNulty et al., 2017). Yet, in the absence of shorter-term repeated assessments of IPEs and concurrent dyadic interactions, any interpretations regarding whether relationship experiences shape IPEs, as well as the time scale on which such updating occurs, remains largely speculative.

In sum, existing work within relationship science does not seem able to resolve the question of whether implicit (relative to explicit) partner evaluations are malleable or rigid on a short-term basis. However, there is a large body of work from the wider implicit social cognition literature that has considered how and when implicit evaluations *in general* revise to reflect new information as compared to explicit evaluations. We will next discuss evidence from this literature that suggests *resistance to updating* in implicit evaluations, on the one hand, or *sensitivity* in implicit evaluations, on the other.

Evidence for Updating-Resistance in Implicit Evaluations

Over the last two decades, there has been an intensive focus within social cognition research on understanding patterns of change and stability in implicit and explicit evaluations of social targets (usually strangers, members of specific social groups, or

fictional characters rather than close others; e.g., Cone & Ferguson, 2015; Gregg et al., 2006; Lai et al., 2016; Rydell et al., 2007). A traditional assumption within many dual-process models of attitude formation and revision is that explicit evaluations reflect fast-changing processes, whereas implicit evaluations reflect slow-changing processes (Wilson et al., 2000). Implicit evaluations have been conceptualized as the sum of learned associations which are stored in memory as an associative network (Fazio, 2007), and modification of that network is one major route to the updating of implicit evaluations (Gawronski & Bodenhausen, 2006). In many cases, this modification occurs through a gradual process requiring repeated pairing of targets with valenced stimuli (Gawronski & Bodenhausen, 2011). Because explicit evaluations rely instead on the validation of propositions, and not necessarily on change in associations, they may be updated quickly as long as new information is accepted as valid (Gawronski & Bodenhausen, 2011).

A variety of empirical studies support the idea that implicit, as compared to explicit, evaluations are less sensitive to recent experiences (e.g., Gawronski & Strack, 2004). For instance, new counter-attitudinal information has been shown to dramatically shift previously formed explicit evaluations of novel targets without affecting implicit evaluations (Gregg et al., 2006), or to only shift implicit evaluations in a slow, gradual fashion (Rydell et al., 2007). Implicit evaluations appear especially difficult to modify in domains that elicit strong social desirability concerns (e.g., evaluations related to race). Although a limited number of laboratory interventions have been shown to induce small changes in implicit evaluations towards social groups (Lai et al., 2014), none of these effects appear to last longer than several hours or days (Lai et al., 2016). Similarly, at the population level, implicit evaluations remain relatively stable over periods of years (Schmidt & Nosek, 2010) and generally update more slowly than explicit evaluations do (Charlesworth & Banaji, 2019).

Generalizing findings from this *implicit updating-resistance* perspective to the domain of romantic relationships, this implies that everyday positive and negative interactions with a romantic partner could often lead to rapid revision in EPEs but little, if any, perceptible revision in IPEs. Specifically, some of these lines of work (e.g., Forscher et al., 2019; Payne et al., 2017) suggest that change in IPEs may not even be robustly linked to new personal experiences in relationships, whereas others (e.g., Rydell et al., 2007) suggest that instead of shifting rapidly day-to-day, IPEs might rather adjust gradually as several new experiences accrue over time (e.g., across repeated experiences of conflict in a previously low-conflict relationship). This latter possibility may explain why IPEs have been shown to correlate with relationship experiences measured on much earlier occasions (Hicks et al., 2016; Murray et al., 2010).

Evidence for Sensitivity in Implicit Evaluations

However, the social cognition literature is not univocal regarding the question of whether, when and how implicit evaluations update over time. First, from a conceptual perspective, the process through which implicit evaluations are formed (and updated) may be especially well-suited to representing a complex history of more- and less-positive experiences

with an attitude object (Fazio, 2007). As noted earlier, the prototypical mechanism of change in implicit evaluations involves repeated pairings between the attitude object and rewarding (or aversive) experiences, as in evaluative conditioning paradigms (Jones et al., 2010; Olson & Fazio, 2001). Given that it can occur automatically, associative learning (compared to deliberate propositional reasoning) could accurately track a large volume of varied experiences with a target and, thus, more precisely reflect the aggregate reward (or cost) associated with that target (Fazio, 2007).

Second, some empirical evidence challenges the traditional perspective that implicit evaluations update only slowly and with difficulty. Under some circumstances, implicit evaluations appear to update to incorporate new information just as flexibly or even more quickly than do explicit evaluations (Van Dessel et al., 2016, 2019). For instance, implicit (vs. explicit) evaluations may be more malleable when new information or experience a) induces a new association that affects one's associative network related to a target, but b) this association is rejected as a valid basis for one's explicit evaluation of that target (Gawronski & LeBel, 2008). Indeed, if romantic partners are motivated to maintain positive relationship beliefs, they may consider new (negative) propositional information to be inconsistent with their wider network of beliefs and thus refrain from basing EPEs on that information. Furthermore, when new information is highly diagnostic of a target's true character, highly believable, or casts past information in a new light, this may lead to especially fast and durable revision of implicit (and explicit) evaluations (Cone & Ferguson, 2015; Mann & Ferguson, 2015, 2017)—at least for targets regarding whom participants do not have personal knowledge and long-standing prior associations (see Ferguson et al., 2019).

Finally, longitudinal investigations have revealed that for *individuals* (rather than populations), implicit (vs. explicit) evaluations toward a range of targets (e.g., the self, racial groups, sexual minorities) are actually *less* stable over long spans of time (see Gawronski et al., 2017). Notably, in a reanalysis of Lai et al.'s (2016) data, Vuletich and Payne (2019) found that even though average levels of implicit bias often remain constant in a population (hence appearing resistant to change), individuals within those samples show highly unstable, fluctuating levels of bias. These findings are consistent with a perspective in which implicit (vs. explicit) evaluations are especially sensitive to recent experiences, particularly if these experiences are affectively strong and diagnostic. From this perspective, EPEs should remain more stable than IPEs if the ongoing events that continually reshape one's underlying associations do not reliably affect the propositional beliefs one relies on when making explicit evaluations (Gawronski & Bodenhausen, 2011), or if people strive to maintain cognitive consistency and stability in their explicit evaluations (Gawronski, 2012), or both.

Taken together, evidence from this *implicit sensitivity* perspective suggests that IPEs may in fact be relatively malleable—at least in some contexts. Moreover, IPEs may not only vary more within individuals, but also track relational costs and rewards more accurately than do EPEs (Hicks & McNulty, 2019). This perspective could explain why implicit partner evaluations seem to index signs of trouble long before explicit reports show

tangible changes (McNulty et al., 2013). Finally, both implicit and explicit evaluations may update especially rapidly when counter-attitudinal experience are highly diagnostic, highly believable, or trigger reinterpretation of a partner's past behavior. Although such potent counter-attitudinal circumstances may be rare in romantic relationships, some experiences with a partner are nevertheless likely to do all of these, such as in the case of major betrayals or major shifts in the status of the relationship (e.g., breakup).

The Present Research

To summarize, the present work seeks to investigate the question of how IPEs, as compared to EPEs, fluctuate and update over time in romantic relationships. There is now compelling evidence suggesting that IPEs have substantial implications for interpersonal and intrapersonal well-being, including such outcomes as marital quality (McNulty et al., 2013), relationship stability (Lee et al., 2010), and individual mental health (McNulty et al., 2019). Given that IPEs are associated with a range of societally meaningful outcomes, it is critical to understand how these evaluations are formed and updated in partners' day-to-day lives.

Although a large body of work in social cognition has explored—and debated—whether implicit vs. explicit evaluations update in response to experimental manipulations in laboratory settings, we still know little about how these evaluations are shaped by experiences in everyday life. Many of these studies have examined changes in implicit evaluations toward a fictional character with whom the perceiver has no prior history (e.g., "Bob"; Cone & Ferguson, 2015) or toward a broad group of individuals (e.g., Black Americans; Lai et al., 2014, 2016) in single laboratory sessions, rather than assessing changes that could reflect new real-world interactions with well-known others, such as a romantic partner. Although a smaller number of studies have investigated evaluative fluctuations longitudinally (Charlesworth & Banaji, 2019; Gawronski et al., 2017), these studies have not attempted to explain these fluctuations within the context of a perceiver's ongoing experiences with the evaluative object (e.g., a romantic partner) as they naturally occur in everyday life.

In this regard, romantic relationships provide an ideal context for understanding how people's implicit vs. explicit evaluations toward a specific target are likely to update in response to their real-life interactions with that person (see Faure et al., 2020). Yet, relevant prior work in relationship science mainly relies on cross-sectional investigations (Hicks et al., 2016, 2018; Zayas & Shoda, 2015) or non-naturalistic manipulations of evaluative associations (McNulty et al., 2017). Although a few longitudinal studies have shown that specific interpersonal experiences (e.g., sexual frequency, conflict) are associated with long-term changes in IPEs vs. EPEs assessed months or years later, these studies have not documented the more fine-grained day-to-day processes that may underpin these changes. Furthermore, because these studies have focused on one type of relationship experience at a time, it remains largely unclear how IPEs and EPEs respond to the fuller spectrum of daily experiences encountered by relationship members.

In fact, given the unique level of interdependence that characterizes romantic relationships, partners often engage in many qualitatively distinct kinds of interactions even within the span of a single day, each of which has the potential to either strengthen or weaken the bond between them. Specifically, interactions that involve positive emotional exchange, including novel and exciting shared activities (e.g., Aron et al., 2000; Muise et al., 2019), sexual intimacy (e.g., Hicks et al., 2016; Maxwell & McNulty, 2019) or even simple shared humor (e.g., Fraley & Aron, 2004; Jeffrey A. Hall, 2017), are typically associated with personal well-being, closeness, and relational satisfaction. Perhaps equally important to the maintenance of a healthy relationship are the responses that partners may offer each other when challenges arise, such as goal support (e.g., Brunstein et al., 1996; Feeney, 2004), responsiveness (e.g., Reis & Clark, 2013; Sprecher & Hendrick, 2004), and gratitude (e.g., Algoe, 2012, 2019). However, romantic partners also inevitably encounter situations that evoke negative feelings and afford relationship-damaging behavior. Such potentially harmful experiences include conflict (Kiecolt-Glaser & Newton, 2001), jealousy (Buunk & Bringle, 1987), or inefficient interaction between partners (i.e., high-maintenance interaction; Finkel et al., 2006).

To our knowledge, no existing research has measured daily implicit and explicit partner evaluations in the field while also assessing, on the same time scale, the key interpersonal experiences a person encounters with their partner. Is it the case that implicit (compared to explicit) partner evaluations quickly register shifts in relationship experiences, providing a more accurate or fast-moving signal of the true costs and benefits of a partnership? Or are implicit partner evaluations relatively resistant to new information, showing only gradual revision (if at all) in line with changing circumstances in the relationship? And are these two different types of partner evaluations likely to respond similarly to counter-attitudinal information that is highly diagnostic about the relationship? These competing possibilities should each imply a distinct pattern of empirical results (see Table 1 for a summary of the predictions from these two accounts).

Table 1. Summary of predictions made by the implicit sensitivity and implicit updating-resistance perspectives

Implicit Updating-Resistance **perspective: Implicit partner evaluations are rigid and resistant to new information; explicit evaluations more quickly incorporate new valenced information**				
	Fluctuation over time	Covariation with daily events	Responsiveness to aggregate experience	Responsiveness to diagnostic experiences
IPEs	Low	Low	High	Unclear
EPEs	High	High	Low	Unclear
Implicit Sensitivity **perspective: Implicit partner evaluations are highly malleable and quickly incorporate new valenced information; explicit partner evaluations are maintained at stable high levels via motivated processes**				
	Fluctuation over time	Covariation with daily events	Responsiveness to aggregate experience	Responsiveness to diagnostic experiences
IPEs	High	High	Unclear	High
EPEs	Low	Low	Unclear	High

Following the *implicit updating-resistance* account of partner evaluations informed by traditional models of implicit social cognition, we would expect to see a distinctive pattern in how IPEs vs. EPEs update over time. First, IPEs should be relatively more stable with a smaller degree of fluctuation over time. Second, this general pattern should reveal itself in a weaker coupling between IPEs (relative to EPEs) and daily relationship experiences. Third, to the extent that they rely on slow-changing underlying processes, IPEs should be better predicted by aggregated relationship experiences (e.g., experiences averaged over several prior days or weeks) than by one's most recent experiences alone. For EPEs, however, very recent experiences with the partner should be equally good (or better) predictors of evaluations compared to the aggregate of one's experiences over multiple preceding days or weeks. Lastly, according to this perspective, it remains unclear how IPEs and EPEs may respond to highly diagnostic information. That is, revisions in IPEs should primarily depend on whether people are repeatedly exposed to the given information, rather than on whether that information is diagnostic or not; and EPEs should only be updated by diagnostic information when that information is accepted as a valid basis for updating one's judgment.

The *implicit sensitivity* account of partner evaluations, in contrast, integrates two lines of work: First, research on motivational biases in romantic relationships, which suggests people seek to maintain positive (explicit) evaluations of their partner; and second, newer research from the broader implicit social cognition literature which suggests that implicit evaluations can be sensitive and revised rapidly, albeit perhaps under different circumstances than those which produce rapid revisions in explicit evaluations. Drawing upon this perspective, we would expect to see IPEs and EPEs following a different relative pattern of revision over time. First, we would expect IPEs (relative to EPEs) to be less stable over the course of the relationship. Second, we should observe tighter coupling between IPEs and daily relationship experiences, relative to EPEs. Third, we would not expect either IPEs or EPEs to be better predicted by aggregated rather than discrete relationship experiences, as it is not clear that the processes which maintain the stability of EPEs (per this framework) should become any less potent with repeated counter-attitudinal experiences. However, we would expect that *both* IPEs and EPEs would shift dramatically in response to experiences that are highly diagnostic, trigger reinterpretation of past relationship experiences, or both (e.g., the experience of relationship dissolution).

We tested the predictions generated by these two perspectives across two dyadic studies. In Study 1, we analyzed an existing dyadic dataset to examine how shifts in both IPEs (SC-IAT; Karpinski & Steinman, 2006) and EPEs were associated with conversation-specific experiences in a videotaped interaction of romantic couples. This design offers the opportunity to conduct an exploratory assessment of the sensitivity of IPEs to relationship experiences within the well-controlled context of a standardized in-lab interaction. In our main study (Study 2), we employed a combined daily diary and longitudinal paradigm among romantic couples to investigate how within-person, daily fluctuations in IPEs (AMP; Payne et al., 2005) and EPEs covaried with core positive and negative relationship

experiences. This design further enabled us to assess the temporal dynamics of these fluctuations over different time spans (i.e., whether IPEs vs. EPEs are increasingly sensitive to the accumulation of relationship experiences across multiple days). Together, these studies allowed us to investigate our key questions using different methods of measuring IPEs (Studies 1 and 2) and leveraging a powerful within-person, repeated-measurement approach (Study 2) that permitted a fine-grained, ecologically valid test of our competing predictions. All research material and code can be found at https://osf.io/rbxa8/

STUDY 2.1

Method

Participants

In this study, 260 participants (129 opposite-sex and 1 same-sex romantic couples) were recruited in the Netherlands through various methods (e.g., personal contacts, social networks, websites, flyers). After removing individuals who did not comply with instructions (i.e., two couples and one individual participant), the final sample consisted of 255 participants whose age ranged from 18 to 43 years old (M = 23.31, SD = 3.64) and whose relationship duration with their partner ranged from 4 months to 17 years (M = 33.91 months, SD = 29.01). In this sample, 63.9% of individuals were students and 33.7% were full-time workers (the remaining 2.4% were both studying and working). Moreover, 34% of the couples were living together and 2.4% were married (see Supplemental Material for further details regarding recruitment procedure, sample characteristics, and previous publications using this dataset).

Procedure

All data collection procedures were approved by a research ethics committee at the VU Amsterdam. In this study, couples came to the lab for an Intake session and provided consent. After that, we assessed participants' explicit and implicit partner evaluations. Next, couples were asked to engage in a 7-min videotaped conversation in order to discuss a divergence of interests that they were currently facing in their relationship. A topic of divergence of interest was defined as one in which both partners had different preferences. They were instructed to discuss such topic as they would normally do at home and to do so in an effort to solve their divergence of interests. Using videotaped conversations is the gold-standard measure of dyadic interactions in relationship science, not only because relationship experiences encountered during the conversation are meaningful in the moment, but also because they are a valid representation of the pattern of interactions occurring in the relationship (see Overall & McNulty, 2017). At the end of their conversation, participants were asked to indicate to what extent they had positive and negative experiences during that interaction with their partners. They also completed

the same implicit and explicit measures of partner evaluations a second time to capture temporary changes in implicit and explicit evaluations from pre- to post-conversation.

Material

Implicit Partner Evaluations. In this study, we assessed participants' implicit partner before and after the conversation with a Single Category Implicit Association Test (SC-IAT; Karpinski & Steinman, 2006). This computer-based behavioral test, which is a variant of the traditional IAT (Greenwald et al., 1998), has proven to be a valid and reliable tool that is particularly suited to measure the magnitude of the mental evaluative associations towards a single attitude object (i.e., a romantic partner) for which there is no reference category to compare it to (Karpinski, 2004; Karpinski & Steinman, 2006). In this task, participants were instructed to indicate whether the target words sequentially presented on the screen belonged to a category that was located on the top left (key response "E") or right corner of the screen (key response "I"), as quickly and accurately as possible (errors were followed by a red cross). Target words were randomly drawn from three categories: *Positive* (21 items; e.g., fabulous), *Negative* (21 items; e.g., disgusting), or *Partner*-related (3 items; i.e., the close other's first name, last name, and nickname (or alternatively, the partner's initials), all provided by the participant before the task). Following Karpinski and Steinman's (2006) procedure, for each SC-IAT, participants performed two different blocks of 96 trials each. In one block, the category *Partner* was paired with *Positive* on the same side of the screen (compatible block), while in another block (incompatible block), the categories *Partner* and *Negative* were coupled together (presentation order of the two blocks was counterbalanced between participants). In each block, target words were presented using a 7:7:10 ratio so that 58% of correct responses were on one response key (e.g., *Positive* and *Partner* words in the compatible block) and the other 42% were on the other response key (e.g., *Negative* words in the compatible block). Further details for this task (i.e., script, organization of the blocks, and stimuli) is reported in the Supplemental Material.

Pre- and post-conversation SC-IAT scores were computed on the basis of standard IAT scoring algorithms (Karpinski & Steinman, 2006; Greenwald et al., 2003): Practice trials were eliminated, responses below 350ms or above 3,000ms were discarded, and error responses were replaced by the block mean of the participant to which we added a 400ms penalty. Next, the averaged response times in the compatible block were subtracted from those in the incompatible block, and then divided by the within-individual standard deviation of all correct response times. Thus, higher scores represent more positive implicit partner evaluations, as reflected by faster reaction times in the compatible block (i.e., partner-positive) than in the incompatible block (i.e., partner-negative). For both SC-IATs, internal consistency indices were calculated using a split-third method with Spearman-Brown correction (Karpinski & Steinmain, 2006), which showed good reliability before and after the conversation (adjusted *r*s = .79 and .73, respectively).

Explicit Partner Evaluations. Similarly, as an estimate for EPEs, we assessed how participants explicitly evaluated their relationship with their partner (1 item; "Right now, I feel satisfied with our relationship") at the moment right before and right after the conversation on a 7-point Likert scale (1 = *not at all*, 7 = *extremely*).

Relationship experiences. After the conversation, we also assessed the extent to which participants encountered positive (i.e., feeling understood, feeling supported, perceiving support from partner, perceiving responsiveness from partner) and negative (i.e., perceiving conflict) experiences while interacting with their partner in two different ways. First, participants watched their own 7–min videotaped interaction and indicated how much they *felt understood* and *felt supported* by their partner for each 30-sec segment of the video on 7-point Likert scales (1 = *not at all*, 7 = *very much*). These 14 ratings were then averaged to obtain mean scores for each of these two constructs. Second, participants indicated they general impression of the conversation overall. That is, how much they *perceived* their partner as *supportive* and *responsive* during the conversation, and how much they perceived the conversation as a *fight* (1 = *not at all*, 7 = *very much*). Given the theoretical and empirical overall shared by the four variables assessing positive experiences (i.e., feeling understood, feeling supported, perceiving support from partner, perceiving responsiveness from partner), we aggregated them into a single measure of *positive and responsive partner behavior* ($\alpha = .92$).

Results and Discussion

To examine whether the positive and negative relationship experiences encountered during the in-lab conversation task predicted temporary changes in implicit and explicit evaluations, we ran two multilevel regression models that accounted for the dyadic nature of our data (i.e., individuals nested within couples; Kenny et al., 2006). We regressed participants' post-conversation implicit (or explicit) evaluations onto positive and responsive partner behavior and conflict, controlling for their pre-conversation implicit (or explicit) evaluations. As can be seen in Table 2, neither positive and responsive partner behavior nor conflict were associated with changes in implicit partner evaluations. As a comparison, changes in explicit evaluations were positively predicted by positive and responsive partner behavior, and negatively associated with perceived conflict during the interaction.

Together, these preliminary results support assumptions derived from the *implicit updating-resistance* perspective. Overall, temporary changes in explicit evaluations were found to be relatively closely linked to the experiences people encountered during a naturally-occurring conflict discussion. Conversely, changes in implicit partner

evaluations showed no significant associations with these experiences.[3] These findings thus suggest that, when assessed at any single time point, EPEs may better reflect recent relationships experiences than do IPEs, which is in contradiction with assumptions drawn from the *implicit sensitivity* perspective. It is important to note, however, that Study 1 only involved a one-time assessment of relationships experiences in an artificial setting. Thus, it remains unclear whether IPEs might be more robustly associated with the accumulation of relationship experiences that people encounter on an ongoing basis in their everyday lives—a link which might be best detected through highly powered repeated-measures methods.

Table 2. Multilevel Models for Changes Pre-/Post-Conversation in IPEs and EPEs.

Model	*B*	*SE*	*df*	*t*	*p*	95% CI
Outcome: Post-Conversation IPEs						
Pre-Conversation IPEs	0.31	0.07	211.42	4.65	<.001	[0.18, 0.44]
Positive and Responsive Behavior	0.08	0.07	166.70	1.19	.237	[-0.05, 0.21]
Conflict	0.05	0.07	151.05	0.779	.437	[-0.08, 0.18]
Outcome: Post-Conversation EPEs						
Pre-Conversation EPEs	0.57	0.05	176.32	10.95	<.001	[0.46, 0.67]
Positive and Responsive Behavior	0.23	0.06	182.45	4.22	<.001	[0.12, 0.34]
Conflict	-0.13	0.05	168.48	-2.41	.017	[-0.23, -0.02]

Note. IPEs = Implicit Partner Evaluations; EPEs = Explicit Partner Evaluations.

STUDY 2.2

Study 1 provided preliminary evidence in favor of an *implicit updating-resistance* perspective of partner evaluations, in that EPEs showed robust temporary changes in response to relationship experiences within a single interaction, whereas IPEs did not. However, the design of Study 1 did not allow us to assess the stability of these two types of evaluations over time, or to examine whether and how they respond to daily relationship experiences in real-life contexts, nor to investigate whether the accumulation of relationship experiences translate into enduring changes in such evaluations. Study 2 addresses these issues. In particular, Study 2 sought to examine four research questions pertaining to how

3 One possible explanation for observing stronger associations between EPEs (vs. IPEs) and relationship experiences may be due to the fact that, as opposed to IPEs, both EPEs and relationship experiences were assessed through self-report (i.e., shared-method variance; Orth, 2013). In an effort to rule out this alternative explanation, we examined whether revisions in EPEs and IPEs were associated with verbal and nonverbal behaviors exhibited by the partner in the interaction as objectively coded by independent raters. Overall, results from objective assessments corroborated those from subjective perceptions of relationship experiences. Because these data are part of another manuscript, we report these results in the Supplemental Material for informative purposes only.

people's implicit and explicit partner evaluations change over time in response to real-life interactions with their partner. To test the competing predictions derived from the two perspectives outlined in the introduction, we used a complementary set of statistical tools to a) investigate how IPEs and EPEs fluctuate over time, b) assess to what degree shifts in IPEs and EPEs are linked to ongoing relationships experiences, c) examine whether IPEs and EPEs update rapidly in response to discrete relationships experiences, or rather update gradually as a function of aggregated experiences, and additionally d) explore how IPEs and EPEs respond to highly diagnostic counter-attitudinal information about the relationship (specifically, break-up). To do so, we conducted the first-ever diary study sampling IPEs, EPEs, and assessments of relationship experiences on a daily basis across two weeks, from both couple members, allowing for an extremely granular view of fluctuations in IPEs and EPEs within the context of ongoing positive and negative interactions between romantic partners.

Method

Participants

In this study, we recruited 174 opposite-sex couples (N = 348) from the Netherlands through various approaches (social networking, flyers, etc.). In line with current recommendations (Finkel et al., 2015), this sample size was defined before data collection, based on our financial and recruitment constraints, and combined with a diary design to provide adequate statistical power. To be eligible, participants were required to (a) be exclusively committed to their partner for 4 months or more, (b) be 18 years of age or older, (c) see each other on a daily basis, and (d) be fluent in Dutch. At the start of the study, on average, participants' age was 24.73 years old (SD = 6.44) and they had been committed to their partner for 3.76 years (SD = 4.48). Furthermore, half of our couples were living together and 7.2% of them were married (see Supplemental Material for further details regarding recruitment procedure, sample characteristics, and previous publications using this dataset).

Procedure

All data collection procedures were approved by a research ethics committee at the VU Amsterdam. At the start of the study, couples came to the laboratory for an Intake session. Upon their arrival, they received information regarding the study concept and provided informed consent as well as required contact information for the Diary portion of the study. Then, to implement our implicit measure, participants were all photographed in identical conditions (i.e., with the same neutral background, camera and distance) and photos were subsequently resized to 0.15 MegaPixel via IrfanView to ensure identical properties for all stimuli. Next, participants were invited to take place in separate cubicles

to complete various questionnaires and an implicit partner evaluations task.[4] At the end of the Intake session, they received both verbal and written instructions about the Diary phase of the study, which started the following day. In this phase, every evening at 8:00pm for 14 days, each participant received an email containing a link to complete an implicit partner evaluations task on Inquisit Web (Millisecond, 2015). They were then automatically directed to Qualtrics.com to answer a short survey in which they were asked to indicate what happened during that day. To ensure reliable data, participants were explicitly reminded to complete each and every daily assessment individually (i.e., refraining from communicating with their partner regarding their answers), under appropriate condition (i.e., quiet environment) and before midnight (to prevent potential overlaps with the next assessment). At the end of the 14-day Diary procedure, participants were reminded that they would be contacted every 4 months over the next year in order to complete three Follow-up assessments. Thus, respectively 4, 8 and 12 months, respectively, after the last daily diary assessment, they received a similar email as in those received in the Diary portion of the study that contained a link to Inquisit Web for the implicit partner evaluations task, before being directed to Qualtrics.com for a short survey regarding the past 4 months. These measures were completed both by participants who reported their relationships were intact and by those who reported having broken up, although the content of self-reported measures was somewhat different for the latter group. Finally, participants were thanked and received a debriefing form. At the end of the study, they received 50€ for taking part in the initial Intake session and completing at least 80% of the daily diaries and at least two follow-up waves. In addition to this financial compensation, their e-mail address was entered into a raffle for a chance to win an iPad.

Measures

Implicit Partner Evaluations. To assess participants' implicit partner evaluations, we used a version of the Affect Misattribution Procedure (AMP; Payne et al., 2005), one of the most widely used implicit measures in psychological research (Payne & Lundberg, 2014). Over the last decade, a large body of research has demonstrated the usefulness of the AMP as a non-relative implicit measure that produces high reliability indexes, large effect sizes and good predictive validity in various domains (Cameron et al., 2012; Nosek et al., 2011; Payne & Lundberg, 2014), including ongoing and past romantic relationships (Banse et al., 2013; Imhoff & Banse, 2011). In this computer-based task, participants are quickly presented with Chinese pictographs in random order on the screen. For each of these pictographs, their goal is simply to indicate whether they find it more pleasant (response-key "E") or less pleasant than average (response-key "I"), as rapidly as possible. Importantly, participants are encouraged to use their spontaneous reactions to guide their decisions and are told that there are no "correct or incorrect" answers to this

4 Intake measures were aimed at examining different research questions, which do not overlap theoretically or empirically with the current investigation and, thus, will not be further discussed.

exercise. Before each pictograph, a picture prime is also rapidly displayed on the screen. Participants are explicitly instructed to ignore these picture primes when evaluating the Chinese characters. Despite these instructions, however, abundant evidence indicates that individuals nonetheless unintentionally misattribute the spontaneous affective feelings elicited by the prime to the Chinese pictograph, and that such misattribution does not depend on their awareness of the task or their self-reported intention to rate the prime (Banse et al., 2013; Gawronski & Ye, 2014, 2015; Payne et al., 2013).

Because of its simplicity of both implementation and use, the AMP seemed well-suited to be administered briefly on multiple occasions, and especially within a daily online diary. Moreover, given that pictures strongly activate one's spontaneous feelings toward the partner, there is evidence showing that such primes produce stronger and more reliable effects than lexical stimuli (e.g., Scinta & Gable, 2007). Thus, in our study, we used 4 different pictures[5] of each participant's partner (i.e., front face, profile, full body standing up, upper body sitting down; e.g., McNulty et al., 2013). Additionally, we used 4 picture primes of opposite-sex attractive alternatives (i.e., 4 faces selected by the participants from a subset of 20 faces prior to the task; these primes were used exclusively during Intake and Follow-up and therefore are not relevant to our main analyses)[6] and 4 neutral stimuli (i.e., picture of a mug, picture of two suitcases, and 2 pictures of a grey square as in the original version of the AMP). In line with Payne et al. (2005), each trial started with a picture prime randomly drawn from set of primes described above (75ms), which was followed by a blank screen (100ms), then by a Chinese character randomly picked out of a set of 200 pictographs (100ms), and finally by a scrambled image in black and white (i.e., a "mask") that remained on screen until response. In the 14-day Diary portion of the study, due to time constraints, only partner and neutral primes were used (i.e., attractive alternatives primes were discarded). Each picture prime was randomly presented 6 times, for a total of 48 test trials. The same method applied to the Intake and the three Follow-up assessments, except for that primes of attractive alternatives were also presented, which resulted in 72 test trials. Prior to initiating this study, we conducted a pilot study to pre-test this AMP version in a 5-day daily diary design, which proved to be a reliable tool (overall $\alpha = .80$, $\alpha s = .61$-$.92$) to assess individuals' daily implicit partner evaluations (see Supplemental Material for further details).

Finally, we followed standard recommendations to compute participants' implicit partner evaluations scores (e.g., Payne et al., 2005; Payne & Lundberg, 2014; Wentura & Degner, 2010). For each time point, we removed observations faster than 350ms or slower than 3,000ms (20.98% of the trials) with the idea that latencies outside of this range are

5 All empirical work described in the present dissertation that used pictures of the self, partner, or attractive alternatives have received approval from the ethical committee of the University hosting the study and participants provided consent to provide (when applicable) and visualize these pictures prior taking part in the investigation.

6 Stimuli for attractive alternatives were pictures with free usage rights retrieved from the web. All pictures have been pre-tested before the start of the study in terms of attractiveness and age to provide a final subset of 40 faces (20 males and 20 females) more attractive than average and ranging from 20 to 50 years old.

unlikely to reflect accurate or spontaneous answers. We discarded overall scores for participants who used the same response for all trials (0.02% of the scores), or who had fewer than 50% remaining latencies (15.62% of the scores) in an attempt to exclude any type of non-valid observations. In the 14-day Diary, we also excluded daily observations provided after 1:00am (0.03% of the scores) to ensure that the quality of our data would not be influenced by extraneous factors (e.g., fatigue) or by the next day's events. Given that participants were required to perform the AMP every day for two weeks in the diary portion of the study, such steps for data preparation were critical to ensure the inclusion of valid observations only. After data cleaning, IPEs scores were calculated by computing the proportion of pleasant ratings following the partner primes. In addition, all analyses were conducted controlling for the proportion of pleasant ratings following neutral primes to ensure that our findings were unaffected by any general rating tendencies towards the pictographs. All descriptive statistics and reliability indices can be found in Table 3.

Overall, the AMP demonstrated very good internal consistency during the diary phase, with daily Cronbach's alphas ranging from .82 to .88 for partner primes (overall $\alpha = .86$) and from .82 to .87 for neutral primes (overall $\alpha = .85$) over the 14 daily diary assessments (similar reliability indices were observed for the other study parts; see Table 3). Moreover, the fact that participants' average reaction times per trial were generally under 1,000ms further supported the notion that their responses were relatively quick and automatic rather than slow and deliberate. Furthermore, and consistent with the idea driving the task, participants expressed more pleasant ratings following partner primes compared to following neutral primes in the diary ($t(3186) = 42.63$, 95% CI [26.44, 28.99], $p < .001$, Cohen's $d = 36.70$) as well as in the other study parts (Intake: $t(340) = 17.08$, 95% CI [28.92, 36.45], $p < .001$, $d = 35.35$; Wave 1: $t(236) = 11.18$, 95% CI [24.50, 34.98], $p < .001$, $d = 40.95$; Wave 2: $t(218) = 10.23$, 95% CI [22.36, 33.02], $p < .001$, $d = 40.04$; Wave 3: $t(206) = 9.43$, 95% CI [20.26, 30.98], $p < .001$, $d = 39.10$; see Table 3). Taken together, these indicators suggest that the AMP appeared to be a valid and reliable measure of IPEs in the present study (also see *Footnotes 10* and *11* for further details regarding test-retest reliability and validity of the task).

Table 3. Descriptive Statistics and Internal Consistency for IPEs Measure (AMP) in Study 2

	N	Reaction times (RTs)		Proportion of pleasant ratings		*α*
		M	*SD*	*M*	*SD*	
Partner Primes						
Intake	341	1004.63	254.42	77.45	21.00	.86
Diary	227.64 [187, 266]	680.13 [822.25, 625.76]	170.25 [130.35, 217.81]	69.11 [63.34, 76.14]	23.93 [21.16, 26.44]	.86 [.82, .88]
Wave 1	237	680.28	162.18	68.29	26.09	.90
Wave 2	219	675.37	171.31	67.78	25.95	.89
Wave 3	207	671.21	162.13	65.71	26.08	.89
Neutral Primes						
Intake	344	1069.84	227.91	44.98	23.86	.85
Diary	228.14 [187, 266]	708.07 [878.87, 634.46]	172.99 [123.77, 220.28]	41.48 [39.57, 45.49]	23.94 [23.09, 24.79]	.85 [.82, .87]
Wave 1	237	713.91	151.57	38.55	24.88	.86
Wave 2	219	709.10	163.61	40.09	24.46	.87
Wave 3	207	692.78	142.47	40.09	24.03	.84

Note. Means (*M*s) and standard deviations (*SD*s) for RTs are in milliseconds. *M*s and *SD*s for proportions of pleasant ratings are in percentages. All statistics for the daily diary phase were averaged across the 14 days (the range of these statistics is reported between brackets). To estimate the internal consistency of the Affect Misattribution Procedure (AMP) at each time point, we computed Cronbach's alphas (α) from three data parcels of the AMP. Specifically, following Bar-Anan & Nosek's (2014) procedure, at each time point, we equally divided the total number of trials into three parcels. The first (vs. second vs. third) parcel included the first (vs. second vs. third) item of each triplet of consecutive trials for each prime type (i.e., partner and neutral). We then computed the proportion of pleasant ratings for both primes in each parcel following the same procedure as the one outlined in our method section and used these three scores to estimate the reliability estimates.

Daily Diary Self-Reported Measures.

Explicit Partner Evaluations. In the Diary, participants reported their current explicit evaluation of their partner (1 item; "Right now, how would you evaluate your partner"; 1 = *extremely negatively*, 9 = *extremely positively*).

Daily Relationship Experiences. Participants were then asked about the degree to which they encountered positive and negative relationships experiences with their partner during the day, across a total of nine constructs (e.g., jealousy, goal support).[7] We used exploratory factor analysis to aggregate these nine constructs into broader, conceptually sensible indices of participants' positive and negative experiences with their partner when possible (see Supplemental Material for further details). This resulted in three separate

7 In this study, participants also indicated to what extent they made sacrifices or perceived their partner making sacrifices for the relationship (or both). However, given the empirical ambiguity regarding whether sacrifice is positive or negative for relationships (for a meta-analysis, see Righetti et al., 2020; for a review, see Righetti & Impett, 2017) and given that this measure is reported in a second, distinct investigation, we did not include these data in the present research.

measures of positive relationship experiences: *positive and responsive partner behavior*, *sexual satisfaction*, and *exciting shared activities*.

We first aggregated four constructs into a broad measure of *positive and responsive partner behavior*: perceived responsiveness (two items; e.g., "Today my partner behaved caringly and attentively toward me"), perceived goal support ("Today my partner helped me make progress toward my personal goals"), perceived gratitude ("Today my partner expressed gratitude for what I have done for him/her"), and shared humor ("Today I shared playful and funny moments with my partner"). All items were rated on a seven-point scale (1 = *not at all*, 7 = *extremely*). The four items were then standardized and averaged to create a composite score. Multilevel reliability analysis following current recommendations (Preacher et al., 2010) showed adequate internal consistency at the within-person, α_{within} = .71, and between-person levels, $\alpha_{between}$ = .89. Our second measure of positive relationship experiences assessed *sexual satisfaction* ("I am satisfied with our sexual activities"; 1 = *not at all*, 7 = *extremely*). Our final measure of positive experiences assessed participation in *exciting shared activities* by asking participants whether or not they had engaged in exciting joint activities other than sex (e.g., travel, sports, taking a walk, going out to eat, attending arts events, concerts, or movies, going to a party) with their partner that day (0 = *no,* 1 = *yes*).

Negative daily relationship experiences were also indexed by three distinct constructs: *conflict*, *high maintenance interaction*, and *jealousy*. First, *conflict intensity* was assessed by asking whether participants had experienced conflict with their partner that day ("I encountered a conflictual situation or I had an argument with my partner"; 0 = *no,* 1 = *yes*) and, if so, the intensity of this conflict ("How intense was this conflict?"; 1 = *not at all*, 7 = *very much*). Participants received an overall conflict intensity score of 0 if they reported no conflict and received a score equivalent to their original conflict intensity rating if they had reported conflict, for a total possible range of 0-7. Our second measure of negative relationship experiences assessed *high maintenance interaction* (HMI; "Maintaining efficient, well-coordinated interaction with my partner required a lot of energy (compared to smooth and effortless interaction)"; 1 = *not at all*, 7 = *extremely*). Finally, our third negative experiences measure assessed *jealousy* ("I felt romantically jealous because of my partner's attention or behavior toward someone else"; 1 = *not at all*, 7 = *extremely*).

Follow-Up Self-Reported Measures. In each of the three Follow-up assessments (see Supplemental Material), participants reported whether they had broken up with their partner since the prior assessment ("Are you and your partner still in a relationship?" 0 = *yes,* 1 = *no*). If participants reported that the relationship was intact, they then reported their explicit partner evaluations (5-item; e.g., "I esteem my partner very much"; 1 = *not at all,* 7 = *completely*; αs across the three waves = .92-.94). If participants reported that the relationship had ended, they reported their explicit ex-partner evaluations (1-item; "How would you evaluate your ex-partner"; 1 = *extremely negatively*; 9 = *extremely positively*).

Analysis Strategy

Over-Time Variation in Explicit and Implicit Partner Evaluations. We used two indices to evaluate the degree of over-time variability in implicit relative to explicit partner evaluations across the diary phase: the intraclass correlation and the autocorrelation coefficients. Intraclass correlation coefficients (ICC) are an index of how much variability in a measure can be explained at the between level (in the present case, differences between participants' mean scores across the diary period) compared to the within level (participants' day-to-day deviations from their own mean). When the ICC coefficient is higher, this suggests that a measure is relatively stable within participants (relative to the degree of variation across participants). In addition, we used autocorrelation coefficients (AR) to examine the degree of day-to-day stability in IPEs and EPEs. Autoregressive models use current measurements of a variable to predict future measurements of that same variable, and thus reflect the degree of continuity in a variable over time. Specifically, we calculated the degree of autoregression in these variables at a lag of one day, with higher autoregression coefficients reflecting stronger resistance to change over time (i.e., less-abrupt day-to-day changes). Because autoregressive models use current measurements of a variable to predict future measurements of that same variable, they reflect the degree of continuity over time and therefore provide an index of stability that is complementary to the type indexed by ICC. As an illustration, scores on a particular measure could vary a great deal within-person across two weeks (low ICC), and yet these within-person shifts could occur in a relatively gradual and smooth fashion from one day to the next (high AR).

Associations Between Daily Relationship Experiences and Relationship Evaluations. Our second research goal concerns whether over-time variability in IPEs and EPEs reflects variations in the daily relationship experiences that one encounters with one's partner. Hence, we used two indices to assess how closely linked implicit versus explicit partner evaluations were to same-day positive and negative relationship experiences. First, we used a standard multilevel modeling approach in which implicit or explicit partner evaluations were regressed on same-day, person-centered positive and negative relationship experiences. Specifically, to account for the non-independent nature of our data, these multilevel models were specified with a cross-classified two-level nesting structure (i.e., measurement occasions crossed with participants, nested within dyads) with random intercepts and fixed slopes, and treated male and female dyad members as indistinguishable (Kenny et al., 2006).[8] Further, as previously mentioned, we used person-centered predictor variables to assess within-person rather than between-person variation (Bolger & Laurenceau, 2013), allowing us test whether days for which participants reported more (or less) positive experiences compared to their own average across the 14-day period were associated with more (or less) positive IPEs or EPEs on that same day. To estimate effect sizes, we used a model comparison approach in which we compared full models for EPEs and IPEs with

8 Additional analyses which included participant gender indicated that none of our main effects of interest were moderated by gender, supporting the indistinguishable dyads approach used here.

their respective empty models (containing no predictors but the same random effects structure for EPEs, and a model with only neutral-prime AMP ratings for IPEs) and then obtained an estimate of pseudo-R^2 adapted to multilevel models.[9]

Our second index of the association between daily relationship experiences and relationship evaluations was the centrality of each relationship evaluation (IPEs or EPEs) within a multilevel network comprised of these two variables and each of the six positive and negative daily experiences variables using multilevel network analysis (Epskamp, Borsboom, et al., 2018; Epskamp, Waldorp, et al., 2018). This technique, implemented using the mlVar package in R, involves sequentially estimating a between-subjects network (which describes the associations of the between-person components of each variable) and a temporal lag-1 network (which regresses the daily person-centered score for each variable onto the prior day's person-centered scores for all variables) in order to finally compute a contemporaneous network (which takes residualized scores from the prior steps and computes partial correlations between all pairs of variables using these same-day residualized scores), which is the focus of this investigation.

Although the methods used in computing a multilevel network bear some similarities to a linear mixed-effects modeling approach described above (e.g., both analyses compute the association between person-centered IPEs and EPEs and each daily relationship experience while accounting for associations with all other daily relationship experiences), the network approach is distinct. First, this technique accounts for both between-person differences and also lagged associations between all variables, meaning that estimates from the contemporaneous network more exclusively reflect same-day associations. Second, this approach estimates the links between IPEs, EPEs, and each type of relationship experiences in a single model, allowing a more direct comparison of how connected IPEs and EPEs are to the full set of daily experiences. Finally, this approach permits us to summarize (and visualize) how daily relationship experiences relate to one another, which in turn permits us to examine how IPEs and EPEs 'fit' within the network of a person's daily relationship experiences. There are a number of ways of indexing how central a variable (also called a node) is within a network, of which we will focus on *degree* (the number of other nodes to which a node is connected) and *strength* (i.e., the weights of the direct connections between a node and other nodes).

Associations Between Aggregated Relationship Experiences and Relationship Evaluations. For our third question, we are interested in whether or not implicit and explicit partner evaluations would be increasingly well predicted by experiences with one's romantic partner as those experiences aggregate over time. We thus calculated *aggregated experience* scores for each of the six daily experience variables. For any given diary day, the aggregated score for a particular category of experience represented the average of the

9 We calculated pseudo-R^2 for the full models following the procedure recommended in Nakagawa and Schielzeth (2013) by using the r.squaredGLMM function from the MuMIn R package. Specifically, we used the marginal pseudo R^2, which reflects the variance explained by the fixed effects in the model.

participant's grand-mean-centered scores for that experience category on that day and all prior diary days. On diary day 1, therefore, the aggregated score reflected only same-day information about the experience; on day 7, the aggregated score reflected the average of that experience on days 1 through 7; and by day 14, the score reflected the participant's overall mean level with regard to that experience.

Supplemental Analyses for Responsiveness to Romantic Dissolution. Finally, we wished to test a prediction stemming from research in the social-cognitive dual-process tradition suggesting that, similar to explicit evaluations, implicit evaluations can change sharply and quickly under particular conditions—specifically, when new counter-attitudinal information is diagnostic of the target's character, believable, or reframes earlier experiences in relation to the target (see Ferguson et al., 2019)—even if they may otherwise show a high degree of inertia. Within a romantic relationship, one of the experiences that is likely to most drastically trigger reinterpretation of prior experiences with the partner (and perhaps suggest new understandings of the partner's "true character") is breakup (Leone et al., 2016). Hence, we used the 1-year longitudinal design of this study as a unique opportunity to explore whether or not IPEs and EPEs show substantial shifts from before to after a breakup.

Results and Discussion

All data preparation and analysis were done in R (R Core Team, 2019) and multilevel models were estimated with the lme4 package (Bates et al., 2020) unless specified otherwise.

Research Question (RQ) 1: Do IPEs or EPEs Show More Stability Across Days?

Our first goal was to assess the stability and fluctuation of implicit and explicit partner evaluations over time. We compared the relative degree of over-time variability in IPEs and EPEs across the diary period using two metrics: the intraclass correlations and the autocorrelation coefficient.

Table 4. Empirical Results Comparing Patterns of Variation Over Time in IPE) and EPEs.

Outcome	ICC	Autocorrelation (φ)	Variance explained by daily experiences	Network node strength
IPEs	.77 [.74, .80]	.14 [.10, .17]	<.01	.00
EPEs	.51 [.46, .55]	.05 [.01, .09]	.11	.67

Note. Variance explained by daily experiences was indexed using Pseudo-R^2 for a multilevel model predicting evaluations from same-day, person-centered reports of responsive partner behavior, sexual satisfaction, shared activities, conflict, high-maintenance interaction, and jealousy.

Intraclass Correlation Across Diary Days. To compute ICCs for each evaluation measure, we first used the ICC package (Wolak et al., 2012) to estimate two random-intercept-only multilevel models with IPEs and EPEs as outcomes during the 14-day diary period. As can be seen in Table 4, the majority of variation (77%) in IPEs was between, rather than within, individuals.[10] This suggests that the extent to which participants deviated from their own mean IPEs on any given day tended to be relatively small in comparison to the typical difference between participants in their mean diary IPEs scores. In contrast, for explicit partner evaluations, a roughly equal amount of variation in scores occurred within individuals and between individuals. Moreover, consistent with predictions derived from the *implicit updating-resistance* perspective, the confidence intervals for EPEs and IPEs did not overlap, implying that IPEs were significantly more stable across the two-week diary period than were EPEs.

Autocorrelation Across Diary Days. Next, we examined day-to-day stability in IPEs and EPEs by calculating the degree of autoregression in these variables at a lag of one day. To do so, we computed random-intercept-only multilevel models and modeled autocorrelation in the outcome variable across a lag of one day using the brms package (Bürkner, 2017). These models estimated the extent to which the current day's (person-centered) relationship evaluation (IPEs or EPEs) was positively associated with the prior day's evaluation. As shown in Table 4, for IPE, the lag-1 autoregressive coefficient (r) was .14, 95% CI [.10, .17], as compared to r = .05, 95% CI [.01, .09] for EPEs. The credible intervals for both of these coefficients did not include zero, indicating that when participants reported IPEs or EPEs scores that were higher (or lower) than their own mean on a given day, they were more likely to report a score on the same variable than was also higher (or lower) than their mean the subsequent day. Moreover, the 95% CIs for each coefficient did not overlap, suggesting participants showed a stronger autoregressive pattern in IPEs compared to EPEs. In other words, consistent with the *implicit updating-resistance* account, not only do IPEs show less overall daily variation around person-level compared to EPEs (as reflected in higher ICC), but they also showed stronger positive associations (i.e., less day-to-day variation) between each day's person-centered evaluations and the next day's evaluations.

10 Of note, these results also indicate that our implicit measure showed good test-retest reliability, which further corroborates the idea that the present AMP appeared to be a reliable measure of individual differences in IPEs, at least in terms of psychometrics properties.

RQ 2: Are IPEs or EPEs More Robustly Linked to Daily Relationship Experiences?

Our second goal was to examine how implicit and explicit partner evaluations covaried with the six daily positive and negative relationship experiences using both traditional multilevel modeling and multilevel network analysis. Table 5 shows multilevel correlations between IPEs, EPEs and all daily relationship experiences.[11]

Table 5. Multilevel Correlations Between IPEs, EPEs, and Daily Relationship Experiences

	1	2	3	4	5	6	7	8
1. IPEs								
2. EPEs	.07***							
3. Neutral AMP	.03	-.01						
4. Pos. Resp. Beh.	.09***	.45***	-.01					
5. Sexual Satisfaction	.04*	.21***	.01	.30***				
6. Shared Activities	.01	.11***	-.01	.22***	.11***			
7. Conflict Intensity	-.03	-.32***	.00	-.32***	-.13***	.02		
8. HMI	-.04	-.30***	-.01	-.34***	-.16***	-.02	.33***	
9. Jealousy	-.01	-.07***	.02	-.04	-.05**	.02	.08***	.06**

Note. IPEs = implicit partner evaluations, EPEs = explicit partner evaluations, Pos. Resp. Beh. = positive and responsive partner behavior, HMI = high maintenance interaction. * $p < .05$. ** $p < .01$. *** $p < .001$.

Multilevel Linear Models. We estimated two multilevel models in which IPEs and EPEs were predicted by the six person-centered daily experiences measures.[12]

11 Consistent with theory (see Hicks & McNulty, 2019) and meta-analytical evidence (see Hicks et al., 2020) suggesting that IPEs and EPEs are weakly associated with one another, we found a significant, albeit small, positive association between IPEs and EPEs over the 14-day period (multilevel correlation $r = .07$, $p < .001$). One possible reason for this association, however, may be that the completion of the AMP on a daily basis for two weeks may have clued participants about the purpose of the task and, thus, led them to respond in a more deliberate (and less automatic) manner. This was not the case; the association between IPEs and EPEs was not significantly moderated by time over the 14-day period in a multilevel model ($p = .368$), suggesting that participants' IPEs did not become more explicit as time went by. Combined with the psychometrics properties described earlier, these results suggest that the AMP may be a valid and reliable tool to successfully assess daily IPEs in the field.

12 In the model predicting IPE, the proportion of pleasant ratings for neutral primes in the AMP was included as a level-1 covariate. Excluding this covariate from analyses provided highly similar results and did not change their interpretation.

Table 6. Multilevel Models Predicting IPEs and EPEs from Daily Relationship Experiences

Outcome: IPEs					
	B	***SE***	***df***	***t***	***p***
Intercept	72.39	1.39	2823	52.19	< .001
Neutral AMP	0.29	0.20	2823	1.43	.154
Pos. Resp. Behavior	0.90	0.24	2823	3.69	< .001
Sexual Satisfaction	0.23	0.22	2823	1.07	.287
Shared Activities	-0.15	0.22	2823	-0.68	.494
Conflict Intensity	0.05	0.22	2823	0.22	.827
Jealousy	-0.07	0.22	2823	-0.31	.754
HMI	-0.01	0.23	2823	-0.06	.952
Outcome: EPEs					
	B	***SE***	***df***	***t***	***p***
Intercept	7.66	0.05	2831	-0.18	< .001
Pos. Resp. Behavior	0.28	0.01	2831	17.32	< .001
Sexual Satisfaction	0.06	0.01	2831	4.24	< .001
Shared Activities	0.03	0.01	2831	1.75	.081
Conflict Intensity	-0.14	0.01	2831	-9.20	< .001
Jealousy	-0.04	0.01	2831	-2.54	.011
HMI	-0.10	0.01	2831	-6.51	< .001

Note. Multilevel models predicting implicit partner evaluations (top panel) and explicit partner evaluations (bottom panel) from same-day person-centered reports of daily relationship experiences. IPEs = implicit partner evaluations, EPEs = explicit partner evaluations, Pos. Resp. Behavior = positive and responsive partner behavior, HMI = high maintenance interaction. IPEs are measured on a 0-100 scale; EPEs are measured on a 1-9 scale.

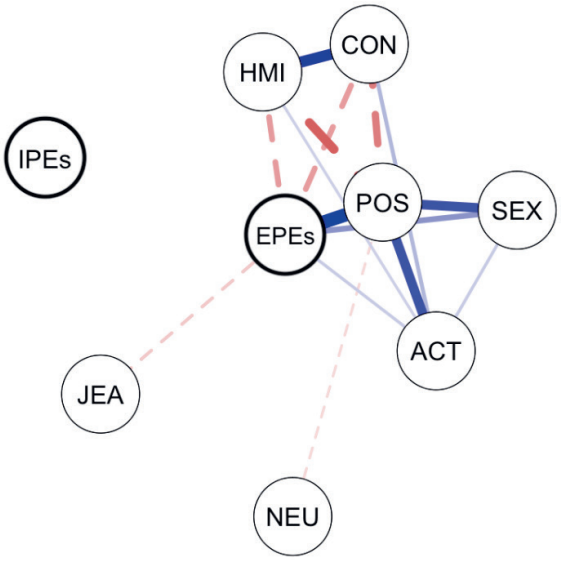
As shown in Table 6, IPEs were positively associated with positive and responsive partner behavior ($B = 0.90$, $SE = 0.20$, $t = 3.69$, $p < .001$). This indicated that on days when participants perceived their partner as engaging in particularly responsive, supportive, grateful and humorous behavior (compared to their norm), they also tended to show more positive implicit partner evaluations, although this link was small in size. However, no other daily relationship experiences significantly predicted day-to-day fluctuations in IPEs. In contrast, daily EPEs were more robustly associated with daily relationship experiences. As can be seen in Table 6, there were independent statistically significant links between five of the six relationship experiences and EPEs (with higher-than-typical levels of positive and responsive partner behavior and sexual satisfaction associated with more-positive EPEs, and higher-than-typical levels of conflict intensity, jealousy, and high-maintenance interaction associated with less-positive EPEs).

We also compared the overall proportion of variance in daily person-centered IPEs and EPEs that could be explained by the six relationship experience variables. Only a very small proportion of daily IPEs could be accounted for by same-day relationship experiences such

as conflict, jealousy, shared positive activities, or sexual satisfaction, *pseudo-*$R^2 < .01$ (or less than 1% of the variance in IPEs). However, variance explained in EPEs was substantially higher (*pseudo-*$R^2 = .11$). Together, these results are again consistent with predictions derived from the *implicit updating-resistance* perspective. Overall, implicit partner evaluations, unlike explicit partner evaluations, showed very little covariation on a day-to-day basis with a broad range of positive and negative relationship experiences.

Multilevel Network Analyses. We used multilevel network analysis as a second approach for assessing how tightly linked implicit and explicit partner evaluations are to fluctuations in daily relationship experiences (Epskamp, Borsboom, et al., 2018). Our model included ten variables: The six relationship experiences variables, IPEs, EPEs, and AMP pleasantness ratings following neutral primes. As can be seen in the contemporaneous network in Figure 1, and similar to the results obtained from multilevel linear models, no significant associations were found between daily IPEs and any of the six relationship experiences. In contrast, EPEs showed same-day associations with five out of six experiences: positive and responsive partner behavior, sexual satisfaction, and shared activities (positive), and conflict intensity and high-maintenance interaction (negative).

Figure 1. Contemporaneous Network Including IPEs, EPEs, and Daily Relationship Experiences



Note. Visualization of the contemporaneous step of a multilevel network mapping same-day associations between relationship experiences, implicit (IPEs) and explicit partner evaluations (EPEs), and the proportion of likes following neutral primes on the AMP (NEU), using daily person-centered scores residualized on prior days' scores for all network variables. POS = positive and responsive partner behavior, SEX = sexual satisfaction, ACT = shared activities, CON = conflict intensity, HMI = high-maintenance interaction, JEA = jealousy. Solid blue lines indicate positive partial correlations; dashed red lines indicate negative partial correlations.

Thus, consistent with the *implicit updating-resistance* perspective, EPEs were more strongly associated with daily relationship experiences as they appeared to both have a higher degree than IPEs (i.e., to be connected to a greater number of other nodes), and also to have greater strength (i.e., the sum of absolute values of significant edge weights connecting EPEs to other network nodes, 0.67, was higher than the sum of edge weights for IPEs, 0.00; see Supplemental Table S5 for a summary of the strength estimates for all network nodes).[13]

RQ 3: Are IPEs and EPEs Related to Aggregated Relationship Experiences Over Time?

We also tested whether fluctuations in implicit and explicit partner evaluations would be better predicted when taking into account relationship experiences across multiple prior days. To do so, we estimated a series of twelve models. In each model, implicit or explicit partner evaluations were predicted from aggregated experience scores for one of the six relationship experience variables, day (coded from 0-13, with 0 being the first diary day), and the interaction of aggregated score and day. If the link between relationship experiences and partner evaluations is stronger when experiences are averaged across a greater number of days (meaning that fluctuations in IPEs or EPEs are increasingly well predicted when considering a longer history of prior relationship experiences), we would expect to see a positive interaction between aggregated score and day. The results of these models are summarized in Table 7.

Three of the six models predicting IPEs included a significant interaction between aggregated dyadic experience scores and day (specifically, the models predicting IPEs from positive and responsive partner behavior, jealousy, and high-maintenance interaction). That is, our findings suggest that the link between these three relationship experience indices and implicit partner evaluations is stronger when taking into account the accumulation of that type of experience over longer rather than shorter periods. Conversely, only one of the six models (i.e., for positive and responsive partner behavior) included a significant main effect of the aggregated experience score. Given that this main effect is estimated when day

13 One potential explanation for why EPEs were more closely related to same-day relationship experiences than were IPEs could be that our measures of EPEs and relationship experiences were subject to shared method variance, as both of them were self-reported explicitly using a similar survey format, whereas IPEs were assessed using a substantially different method (Orth, 2013). Although using person-centered variables controls for stable dyadic- or person-level patterns (e.g., a couple's or participant's general tendency to give positive ratings), it does not rule out the possibility that people may also have day-to-day fluctuations in their broad response tendencies (e.g., a person who is in a particularly good mood on one day may offer more positive responses on all self-report measures that day, compared to their mean). To address this possibility, we re-conducted all analyses presented in section RQ 2 that originally used participant reports of the day's relationship experiences with the partner's reports of these same experiences. Results were almost identical to those obtained with actors' reports (detailed description of methods and results can be found in the Supplemental Material).

is equal to zero, i.e., the first diary day, this mirrors the results obtained with our initial multilevel models and suggests that, in the case of positive and responsive partner behavior, even one day's experience was sufficient to predict the participant's IPEs on that day.

Table 7. Aggregated Daily Experiences Predicting Implicit and Explicit Partner Evaluations

Outcome: IPEs										
	Main effect of aggregated score					**Interaction of day with aggregated score**				
	B	***SE***	***df***	***t***	***p***	***B***	***SE***	***df***	***t***	***p***
Pos. Resp. Beh.	2.66	0.73	3012	3.62	< .001	0.21	0.08	3012	2.82	.005
Sexual Satisfaction	1.12	0.81	3002	1.39	.166	0.06	0.07	3002	0.83	.406
Shared Activities	-0.17	0.60	3011	-0.28	.776	0.12	0.12	3011	1.02	.309
Conflict Intensity	-0.27	0.68	3012	-0.40	.688	0.07	0.11	3012	0.64	.520
HMI	-0.58	0.68	3012	-0.84	.398	-0.22	0.08	3012	-2.58	.010
Jealousy	-1.05	0.57	3012	-1.83	.067	-0.20	0.10	3012	-2.07	.039
Outcome: EPEs										
	Main effect of aggregated score					**Interaction of day with aggregated score**				
	B	***SE***	***df***	***t***	***p***	***B***	***SE***	***df***	***t***	***p***
Pos. Resp. Beh.	0.72	0.05	3017	14.74	< .001	0.00	0.01	3017	0.51	.611
Sexual Satisfaction	0.41	0.05	3007	8.04	< .001	0.01	0.01	3007	1.88	.060
Shared Activities	0.11	0.05	3016	2.37	.018	0.01	0.01	3016	0.78	.433
Conflict Intensity	-0.54	0.05	3017	-10.64	< .001	0.00	0.01	3017	0.41	.679
HMI	-0.41	0.05	3017	-8.64	< .001	-0.01	0.01	3017	-1.72	.086
Jealousy	-0.09	0.04	3017	-2.10	.036	-0.01	0.01	3017	-1.27	.205

Note. Summary of results from twelve multilevel models predicting IPEs (top panel) and EPEs (bottom panel) from aggregated relationship experience scores, day, and the interaction between aggregated scores and day (controlling for AMP pleasantness ratings following neutral primes). IPEs = implicit partner evaluations, EPEs = explicit partner evaluations, Pos. Resp. Behavior = positive and responsive partner behavior, HMI = high maintenance interaction. IPEs are measured on a 0-100 scale; EPEs are measured on a 1-9 scale.

For EPEs, none of the six models included a significant interaction between aggregated score and day (see Table 7). This suggests that the link between daily experiences (such as the degree of positive and responsive partner behavior or the intensity of conflict) and EPEs did not change when a greater number of prior days' experiences were reflected in the aggregate. Consistent with the classical multilevel models reported in the previous section, all six models predicting explicit partner evaluations included a significant main effect of the aggregated experiences score, implying that aggregated scores of relationship experiences were generally associated with explicit partner evaluations even by the first diary day (which only included same-day reports).

Together, these findings are in line with the *implicit updating-resistance* perspective. While EPEs appeared to covary consistently and robustly with same-day relationship experiences, the gradual accumulation of these experiences did not appear to add any value

when predicting fluctuations in EPEs. Conversely, implicit partner evaluations generally did not show a strong association with individuals' same-day relationship experiences. Instead, a set of innovative analyses revealed that IPEs appeared to be more strongly associated with the accumulation of certain everyday relationship experiences over the 14-day diary phase (including positive communication, jealousy, and high-maintenance interaction). This is consistent with the idea that the associations reflected in implicit evaluations can be modified, but that this requires the accumulation of a critical mass of daily experiences, resulting in slower and more gradual change.[14]

RQ 4: How Do IPEs and EPEs Shift Following Breakup?

Finally, our last research question regarded whether IPEs as well as EPEs show substantial revision in response to a relationship event that is likely to be highly diagnostic and to trigger reinterpretation of prior relationship experiences. Given the unique opportunity provided by our longitudinal data, we conducted a supplemental analysis to assess revision in IPEs and EPEs among those couples who had broken up during the 12-month follow-up period.[15] In total, 29 individuals (from 20 couples) both reported that their relationship had ended and provided data on their implicit and explicit evaluations of their ex-partner for at least one wave after breaking up (n = 45 valid observations).

We first estimated a multilevel model in which uncentered implicit (ex-)partner evaluation scores at each follow-up wave were predicted from breakup status (coded as 0 if together, and 1 if broken up) at that wave as well as average IPE scores from the diary period, using the same a cross-classified two-level nesting structure as in the daily diary portion of the study (i.e., measurement occasions crossed with participants, nested within dyads, with random intercepts and fixed slopes, for indistinguishable dyads; Kenny et al., 2006). As shown in Table 8, controlling for average IPE scores from the earlier diary period, people's IPEs were dramatically lower following relationship dissolution.[16] That is, as compared to when the relationship remained intact, breakup was associated with AMP scores that were more than 20 points lower on a 100-point scale (Hedges' g = -0.98). We then conducted a parallel analysis with explicit evaluations. We first transformed explicit evaluations scores of ex-partners from a 9-point scale to a 7-point scale (so that they were scaled equivalently to current-partner EPEs), merged these scores to create a single variable assessing explicit

14 To address the issue of shared method variance, all analyses presented relevant to RQ 3 were also repeated using the partner's reports of these same experiences (when applicable). These parallel analyses provided similar results (see Supplemental Material).

15 These data are also reported in a related (but not identical) analysis to examine a different research question in Hicks et al. (2020).

16 To confirm that these differences represented pre- to post-breakup changes in IPEs, rather than merely representing a between-person difference in IPE positivity among participants who did not experience breakup across the diary period versus those who did, we also completed a version of this analysis solely with those participants who reported a breakup at some time during the follow up. This fully within-person analysis also revealed that these participants had significantly more positive IPEs prior to breakup versus after breakup.

evaluations of both current and ex-partners, and then estimated a model in which explicit (ex-)partner evaluation scores at each follow-up wave were predicted from breakup status at that wave as well as average EPEs scores from the diary period. In this analysis, follow-up EPEs scores were also substantially lower after participants reported that their relationship had ended (Hedges' g = -4.25; see Table 8).

Table 8. Breakup Status Predicting IPEs and EPEs at Follow-Up

Outcome: IPEs					
	B	***SE***	***df***	***t***	***p***
Intercept	20.09	3.70	510	5.42	< .001
Neutral AMP	-0.12	0.03	510	-3.65	< .001
Diary Average IPE	0.77	0.04	510	17.42	< .001
Breakup	-21.60	3.18	510	-6.79	< .001
Outcome: EPEs					
	B	***SE***	***df***	***t***	***p***
Intercept	4.48	0.26	537	16.99	< .001
Diary Average IPE	0.27	0.03	537	7.96	< .001
Breakup	-2.48	0.11	537	-21.82	< .001

Although these results are derived from a relatively small number of participants and thus should be interpreted with caution, this finding is nevertheless consistent with a perspective in which implicit evaluations and explicit evaluations are both highly responsive to very diagnostic events or events that prompt reinterpretation of prior experiences with a target (Ferguson et al., 2019). Relationship dissolution, which often involves a restructuring of one's knowledge structures associated with the partner and relationship (Leone et al., 2016), would likely often meet at least one, if not all, of these criteria. These data cannot clarify, however, how quickly IPEs and EPEs may have changed following breakup, as the separation could have occurred anytime between the prior assessment (four months earlier) and the wave at which breakup was reported. Nonetheless, these analyses suggest that dramatic changes in IPEs (as well as EPEs) can occur following events that substantially reframe one's understanding of one's partner and one's relationship.

GENERAL DISCUSSION

A person's implicit and explicit evaluations of their romantic partner are often only tenuously related, with one category of evaluation potentially suggesting much more positive feelings than the other (Hicks et al., 2020; Scinta & Gable, 2007). Indeed, a range of goals, beliefs, and biases may weaken the ties between the initial automatic affect one feels when thinking of a partner and one's subsequent deliberative evaluation of them

(see Hicks & McNulty, 2019). A growing body of evidence suggests that implicit partner evaluations are sometimes equally, or even more, revealing of the future health of a relationship than explicit evaluations (Faure et al., 2018; LeBel & Campbell, 2009; Scinta & Gable, 2007), including when considering such crucial outcomes as later declines in satisfaction or relationship dissolution (Lee et al., 2010; McNulty et al., 2013).

As research on implicit partner evaluations has flourished, this work has focused on a number of broad themes. For instance, it has illuminated the key role that these evaluations may play in signaling (or perhaps even contributing to) later changes in personal and relational health (McNulty et al., 2013, 2019), addressed the conditions under which explicit evaluations might temporarily align more closely with implicit, uncontrolled evaluations (Hicks et al., 2020; Scinta & Gable, 2007; see McNulty & Olson, 2015), and investigated when implicit evaluations have the strongest connection to overt behavior (e.g., Faure et al., 2018). However, although the generally low correlation between implicit and explicit evaluations of romantic partners forms an integral backdrop to each of these issues, scant work has examined the roots of this misalignment.

How are implicit and explicit partner evaluations connected to the tone and substance of a couple's daily interactions, and can implicit-explicit divergences be explained by differences in the responsiveness of these evaluations to everyday relationship events? Our findings from two large dyadic samples, collected both in the lab and in the field, suggest that implicit and explicit partner evaluations are indeed linked to ongoing relationship events in very different ways. Although prior research suggests that people are often motivated to maintain stable, positive explicit evaluations of a romantic partner (Murray, 1999), we found that explicit evaluations nonetheless showed robust changes that were reliably linked to the positivity of even a single conversation with the partner (Study 1) as well as substantial within-person variation across a two-week period that was closely connected to daily shifts in the nature of a couple's interactions (Study 2). Specifically, when a person perceived more positive and responsive behavior from their partner, felt more sexually satisfied, and experienced less conflict, friction, and jealousy in their relationship, they showed robust same-day increases in the positivity of their explicit evaluations. This link between daily experiences and explicit partner evaluations did not appear to require the accumulation of such experiences over time; aggregating relationship experiences over multiple prior days did not lead to more accurate predictions of daily fluctuations in explicit evaluations.

Implicit partner evaluations, in contrast, showed a very different pattern of change over time. Specifically, unlike explicit evaluations, implicit evaluations did not show changes linked to the positivity of an in-lab discussion (Study 1) and were relatively stable across time, showing less within-person variation and smoother changes from one day to the next within a daily diary study (Study 2). To the extent that these evaluations did fluctuate, these changes were weakly (if at all) predicted by same-day relationship experiences of conflict, sex, and so on. However, the aggregation of particular relationship experiences over multiple days predicted revisions in implicit evaluations. These findings suggest that

daily relationship experiences may begin to be more strongly reflected in implicit partner evaluations when accounting for the nature of these experiences across multiple prior days. Specifically, although same-day experiences of jealousy and high-maintenance interaction were not connected to changes in implicit evaluations, encountering especially high or low levels of these relationship experiences across multiple days appeared to predict implicit evaluations more robustly. And while a partner's positive and responsive behavior significantly predicted implicit partner evaluations even when only considering same-day experiences, this index predicted implicit evaluations even more strongly when more prior days' experiences were taken into account.

Taken as a whole, these results are consistent with the possibility that explicit partner evaluations can be shaped rapidly in response to everyday experiences with a romantic partner, whereas implicit partner evaluations more typically shift slowly in response to aggregate experience over longer periods, or what we called the *implicit updating-resistance* perspective. Indeed, these results align with a long-standing body of social cognition research and theory which suggests that distinct processes may underpin revisions in implicit and explicit evaluations. These perspectives imply that updating of implicit evaluations is rooted in modifications of one's underlying network of associations with a target, which in turn result from repeated experiences in which the target is linked to valenced stimuli (Fazio & Olson, 2014; Rydell et al., 2007). This stands in contrast to the prototypical mechanism of revision in explicit evaluations, which simply requires acknowledging that newly acquired information is valid (Gawronski & Bodenhausen, 2011). The present findings thus suggest that people indeed commonly accept their daily experiences in a relationship as a valid source of new information about their partner and may update their explicit evaluations of their partner accordingly.

Our findings also lend some yet more limited support to the *implicit sensitivity* account of partner evaluations. Study 2 revealed that both implicit and explicit partner evaluations updated sharply following a particularly extreme and diagnostic relationship experience—specifically, romantic breakup. Although this latter finding is based on a small sample size and thus should be interpreted with caution, these findings are nevertheless consistent with recent findings from the broader social cognition literature suggesting that implicit evaluations may be as malleable as their explicit counterparts under specific circumstances of high diagnosticity (see Ferguson et al., 2019).

Implications for Close Relationships Research

Prior close relationships research has suggested that implicit partner evaluations may play a unique role in relationships in part because they are especially sensitive to positive and negative relationship outcomes (see Hicks & McNulty, 2019; McNulty & Olson, 2015). The present findings help to clarify and qualify what it may mean for implicit partner evaluations to be sensitive to experiences with a partner. Explicit, not implicit, partner evaluations showed relatively sharp changes and tight links with relationship experiences in the lab (Study 1) and on a day-to-day basis (Study 2). Thus, explicit evaluations may in

fact *more* quickly register new, isolated positive and negative experiences in a relationship. However, despite the fact that people appear to adjust their daily explicit partner evaluations according to what they concurrently experience on a given day, our findings also suggest that they may be less able—or perhaps less motivated—to explicitly keep track of experiences as they aggregate over time, and thus may not use this aggregate history to inform their explicit partner evaluations. The results of our aggregated analyses lend support to the possibility that implicit, rather than explicit, partner evaluations reflect longer-term patterns in relationship experiences and so may be especially useful signals of relationship problems that have begun to appear chronically.

This perspective is also consistent with longitudinal investigations linking implicit, not explicit, partner evaluations to relationship experienced encountered over several preceding years (e.g., Hicks et al., 2016; Murray et al., 2010). It may be the case that implicit partner evaluations successfully predict downstream outcomes precisely because they are more stable, less vulnerable to sharp day-to-day swings in positivity, and more attuned to aggregated relationship experiences. Conversely, measurements of explicit evaluations may capture more within-person variability in feelings about a relationship, attenuating their ability to signal the longer-term, underlying relationship experiences that will lead to the later flourishing or faltering of a partnership.

One intriguing implication of our findings lies in the fact that positive and responsive partner behavior appeared to benefit both explicit and implicit partner evaluations. In fact, sharing humor and perceiving the partner as more responsive, more supportive, and more grateful yield the strongest and most consistent positive shifts in explicit partner evaluations (across a conversation and on a daily basis) and in implicit partner evaluations (on a daily basis and over time). These findings corroborate others in showing that satisfying relationships may not simply be achieved by keeping negative experiences to a minimum but also—and perhaps especially—by amplifying positive experiences (see Algoe, 2019). In fact, positive experience is not the same as lack of negative experience, and research shows that healthy relationships are not only marked by low levels of negative interactions, such as conflict and rejection (Gottman et al., 1998), but also by particularly high levels of positive interactions, including for instance sharing laughter (Kurtz & Algoe, 2015), disclosing good news (Gable et al., 2006), and showing gratitude to the partner (Algoe et al., 2008). Thus, interventions that specifically aim at maximizing everyday positive interpersonal processes, such as responsiveness (Reis & Clark, 2013), may prove to be an efficient method to bolster short-term implicit and explicit feelings towards one's relationship and, in turn, set the stage for long-term benefits on both relationship and individual health.

Implications for Social Cognition Research

It is important to note that studying implicit evaluations in relationship contexts offers insights beyond relationship science. Indeed, the present research contributes to attitude literature and to implicit social cognition research in several ways. While previous work has investigated the malleability of implicit evaluations towards strangers (e.g., fictional

characters or members of broad social groups) assessed in artificial laboratory settings (e.g., Cone & Ferguson, 2015; Lai et al., 2014, 2016; Rydell et al., 2007), until this point very little was known about how implicit evaluations towards well-known targets update in everyday life. The present research provides long-awaited evidence regarding these missing links in the literature. Thus, this work helps establish the generalizability of the predictions made by traditional models of evaluation formation and change to everyday life situations (Gawronski & Bodenhausen, 2011).

Notably, our findings indicate that the patterns often observed in brief laboratory studies (i.e., relative flexibility in explicit evaluations and relative updating-resistance in implicit evaluations) also extend to real-life contexts in which a perceiver has a deep history of personal experiences with a target. Unlike previous investigations (Forscher et al., 2019; Lai et al., 2016), this work suggests that implicit evaluations may show substantial revision in response to aggregated experiences, such that consistent negative or positive interactions with a partner will, over time, be steadily reflected in IPEs—and this type of repeated positive or negative experience may be common in ongoing close relationships.

These findings also speak to ongoing debates about whether there are circumstances under which implicit evaluations update as or more quickly than explicit evaluations. Although our results in general point to the relative stability of implicit partner evaluations, exploratory analyses suggest that both implicit and explicit partner evaluations drop sharply after a romantic breakup. This is consistent with recent work on evaluations of novel targets suggesting that a number of factors (e.g., the diagnosticity of new information; the extent to which new information prompts reinterpretation of previously learned information) can facilitate immediate changes in implicit evaluations (Ferguson et al., 2019). Unlike novel targets, however, romantic partners typically have a long, rich, and varied history of past experiences with one another that are interwoven with a complex network of personal goals, self-perceptions, hopes, and fears (Cross et al., 2000; Fitzsimons et al., 2015; Murray, 1999). In other words, people may have very deeply rooted implicit evaluations of their partner, and therefore new counter-attitudinal information may need to be especially potent in order to override their history of past learning (Ferguson et al., 2019; Hicks & McNulty, 2019). The end of a relationship may represent just such a powerful experience. Indeed, many romantic breakups likely meet the core criteria identified in this body of research, insofar as breakups often involve events and interactions that are perceived as highly diagnostic of an ex-partner's character and which prompt a powerful reinterpretation of the meaning of past experiences in the relationship.

Lastly, this research contributes to current debates and controversies concerning whether implicit measures are measures of persons or situations. Recent evidence has shown that, at the individual level, implicit evaluations towards racial groups appear to fluctuate almost randomly from one day to another, whereas populations means of these same evaluations remain stable and reflect markers of structural inequality (Vuletich & Payne, 2019). These findings have been taken as evidence that implicit measures may be reliable measurement tools of situations more so than persons, in the sense that they represent one's cultural

surroundings more so than individual learning or personal past experiences (Payne et al., 2017; see also Forscher et al., 2019; Schimmack, 2019). Although this may be true in domains that are strongly influenced by cultural norms (e.g., racial stereotypes), this may not apply to domains that are mainly determined by personal experiences and meaningful interactions with significant others.

Interpersonal relations may represent an especially interesting domain for testing these ideas because relationships are highly idiosyncratic (they vary from person to person), and so are likely to reflect much more than one's cultural surroundings. Although experiences with a partner represent situations, those situations are specific and personal, not culturally shared. In fact, our findings suggest that implicit partner evaluations show relatively high within-person stability over the course of multiple days and weeks within one person, supporting the notion that implicit measures *can* be reliable measurement tools of individual differences in attitudes and that implicit evaluations *can* be reflective of a lasting internalized and personal representation, rather than simply one's immediate environment. Additionally, these evaluations fluctuate in ways that may be meaningfully linked to the accumulation of new interpersonal experiences with a partner that are idiosyncratic rather than culturally shared.

In light of these results, we believe that close relationships may offer the sort of richly meaningful real-life context that has up to this point often been overlooked in implicit social cognition research (see Faure et al., 2020). By exploring how implicit evaluations update in this context on a fine-grained timescale, we garner several novel insights. In sum, this work suggests that implicit evaluations of well-known others, and not only of novel social targets, show resistance to quickly updating and may instead update gradually in the face of consistent experiences of positive or negative valence. Similarly, as with novel social targets, this resistance to updating may not apply when new information about the target is diagnostic, believable, and prompts reinterpretation. Finally, this work implies that for well-known targets, there is meaningful and stable person-level variance, rather than purely situational or environmental variance, in implicit evaluations.

Strengths and Limitations

Before concluding, we should acknowledge some limitations of this work. First, data from both studies are correlational; therefore, although these findings are consistent with a perspective in which explicit partner evaluations are quickly shaped by day-to-day relationship experiences whereas implicit partner evaluations are generally more resistant to change, we cannot rule out the possibility that other causal patterns account for these findings. For instance, it may be the case that day-to-day fluctuations in the positivity of explicit (but not implicit) partner evaluations lead to corresponding changes in the positivity of a couple's interactions that day, rather than explicit evaluations shifting in response to daily experiences. However, the findings from Study 1 are less consistent with this alternative explanation. In this study, implicit and explicit partner evaluations were assessed immediately before and after a conflict discussion, meaning that the observed

association between the relationship experiences encountered within this discussion and pre-to-post changes in explicit evaluations cannot (by definition) be explained by the initial positivity of these evaluations. Future work should assess implicit and explicit partner evaluations in contexts where stronger causal interpretations can be made (for instance, during and after interventions targeted at improving key relationship experiences such as partner responsiveness, participation in exciting shared activities, or conflict resolution).

Another limitation of the methodology used in Study 2 is that daily relationship experiences and explicit partner evaluations were both assessed using a similar self-report format, whereas implicit partner evaluations were assessed using an indirect, computerized task. Consequently, the association between explicit evaluations and daily relationship experiences is likely to be inflated due to shared method variance (Orth, 2013). However, we used analytic strategies that helped us account for several potential sources of shared method variance. First, all predictors in our central analyses (excluding the aggregated analyses) were person-centered, meaning that stable, person- or couple-level differences in patterns of responding cannot account for these associations. Nevertheless, on a day-to-day basis, extraneous factors (e.g., mood, fatigue) could influence a person's explicit partner evaluations as well as their reports of same-day relationship experiences. To address this possibility, we re-conducted these analyses using partner reports of relationship experiences. These findings were highly similar to the original pattern of results and suggested nearly identical interpretations. Future research should strive to make use of non-self-report methods for assessing relationship interactions (e.g., electronically activated recorder [EAR] devices that sample the auditory environment as relationship partners go about their everyday lives; Mehl, 2017) to allow for purer estimates of the strength of the links between daily relationship experiences and explicit and implicit partner evaluations.

Nonetheless, these limitations are qualified by a number of strengths. Foremost, these studies represent the first empirical investigations of how implicit partner evaluations are shaped by experiences in the everyday life of a couple over short time spans (e.g., minutes and days, rather than months or years). By incorporating a measure of implicit partner evaluations into a longitudinal daily diary design (Study 2), this investigation represents not only the first study of day-to-day fluctuations in implicit partner evaluations, but also (to our knowledge) the first-ever study of day-to-day fluctuations in any category of implicit evaluation of a social target, along with a fine-grained inventory of interpersonal experiences with that target. In this regard, our research emphasizes the value of using such highly powered methods (e.g., repeated measures) to detect small yet reliable effects that unfold gradually over time in real-life settings.

Importantly, these results were obtained from two large dyadic samples of romantic couples (total $N = 603$), using two separate measures of implicit partner evaluations (a partner-specific single-category Implicit Association Test [SC-IAT] and a partner-specific Affect Misattribution Procedure [AMP]), and assessing fluctuations in implicit and explicit partner evaluations across two distinct time scales (before and after a seven-minute conflict discussion, and nightly across a 14-day diary). We also tracked revisions

in partner evaluations across two highly distinct contexts: a controlled in-lab conflict discussion, and natural, ecologically valid, everyday interactions between relationship members. Finally, we used an innovative aggregated analysis to estimate the relationship between partner evaluations and the accumulation of daily relationship experiences, as well as a set of advanced analytic approaches that complemented more traditional techniques (e.g., longitudinal multilevel linear modeling) with more recent and computationally sophisticated models (e.g., multilevel network modeling). By comparing the findings derived from these distinct approaches, we were able to ensure that patterns were not due to the idiosyncrasies of one technique, as well as revealing new insights.

Conclusion

The present research reveals that implicit evaluations of romantic partners, rather than being sensitive and flexible indicators of recent changes in relationship experiences, are instead relatively stable over time, gradual in their changes, and decoupled from concurrent daily experiences with one's partner (compared to their explicit counterparts). These findings suggest a potential explanation for the persistent finding that implicit and explicit evaluations are associated with one another weakly, if at all: Implicit and explicit partner evaluations may be shaped and updated on distinct time scales, with explicit evaluations quickly fluctuating to mirror day-to-day changes in the substance of a person's interactions with their significant other, and implicit evaluations shifting more slowly, perhaps in response to the gradual accumulation of relationship experiences. Thus, the unique role played by implicit partner evaluations in forecasting later crucial relationship outcomes may be explained more by their resistance to abrupt revisions than by their sensitivity to the most recent shifts in relationship experiences.

Chapter 3

Speech is Silver, Nonverbal Behavior is Gold: How Implicit Partner Evaluations Affect Dyadic Interactions in Close Relationships

This chapter is based on Faure, R., Righetti, F., Seibel, M., & Hofmann, W. (2018). Speech is Silver, Nonverbal Behavior is Gold: How Implicit Partner Evaluations Affect Dyadic Interactions in Close Relationships. *Psychological Science, 29*(11), 1731–1741. doi: 10.1177/0956797618785899

ABSTRACT

Growing evidence suggests that the seeds of relationship decay can be detected via implicit partner evaluations even when explicit evaluations fail to do so. However, little is known about the concrete daily relational processes that explain why these gut feelings are such important determinants of relationships' long-term outcomes. The present integrative multimethod research yielded a novel finding: that participants with more positive implicit partner evaluations exhibited more constructive nonverbal (but not verbal) behavior toward their partner in a videotaped dyadic interaction. In turn, this behavior was associated with greater satisfaction with the conversation and with the relationship in the following 8-day diary portion of the study. These findings represent a significant step forward in understanding the crucial role of automatic processes in romantic relationships. Together, they provide novel evidence that relationship success appears to be highly dependent on how people spontaneously behave in their relationship, which may be ultimately rooted in their implicit partner evaluations.

Keywords: implicit partner evaluations, nonverbal behavior, dyadic interactions, automatic processes, close relationships, open materials.

Over the past 50 years, the rate of divorce in Europe has increased sharply by 137.5% (Eurostat, 2017). Having a positive romantic relationship is essential to individuals' psychological and physiological well-being (Proulx et al., 2007; Robles et al., 2014). Nevertheless, it is challenging to maintain flourishing relationships in our societies. For decades, countless studies have attempted to investigate predictors of successful and unsuccessful relationships by massively relying on self-report data (e.g., Le et al., 2010). Yet recent findings have demonstrated the crucial role of implicit partner evaluations (i.e., automatic affective associations involving one's partner) in predicting changes in relationship satisfaction over and beyond what partners are able and willing to reveal (McNulty et al., 2013). Surprisingly, however, the reasons why implicit partner evaluations are so important for long- term relational outcomes are still unclear. Do implicit partner evaluations also have short-term effects on relational processes that are fundamental for blooming dyadic interactions?

To address this question, we integrated research from interpersonal processes and social cognition. We pro- pose that implicit partner evaluations are likely to influence spontaneous behaviors that are hard to monitor during romantic communication (Noller, 2006). More precisely, we used observational data and real-life experiences to investigate whether individuals' implicit partner evaluations predict their nonverbal behavior in dyadic interactions and whether nonverbal behavior, consequently, affects relational outcomes.

Implicit Partner Evaluations and Long-term Relational Outcomes

Much relationship research that aimed to study roman- tic dissolution has heavily relied on explicit measures (e.g., deliberated self-reports) to determine the factors that may either maintain or weaken the bond between partners (Le et al., 2010; Rusbult et al., 1998). However, at the explicit level, individuals are often motivated to see their relationship in an overly positive light (Murray, 1999). Because explicit measures are highly susceptible to these motivational biases, they may not accurately capture people's spontaneous affect and attitudes that seem crucial for our theoretical and empirical understanding of relationship processes (e.g., Joel et al., 2017).

One way to overcome these limitations is to assess the automatic feelings and associations involving one's partner using indirect measurements (i.e., implicit measures) that refrain people from monitoring their responses (Baldwin et al., 2010). Indeed, these measures bypass deliberative reasoning and are more suitable for detecting spontaneous affect and emotional experiences that occur in romantic dyads (Banse, 1999; Hicks et al., 2016; Murray et al., 2010). Consequently, implicit partner evaluations assessed by these measures are only weakly related to explicit evaluations (Hicks et al., 2020; Scinta & Gable, 2007) and, ultimately, predict diverse long-term relational outcomes (LeBel & Campbell, 2009; Lee et al., 2010) even when self-reports fail to do so (McNulty et al., 2013).

Implicit Partner Evaluations and Short-term Relational Processes

The aforementioned findings provide compelling evidence regarding the importance of implicit partner evaluations in determining the maintenance of a successful relationship. However, it remains largely unclear why implicit partner evaluations have such a powerful predicting influence on long-term outcomes. According to Fazio (2000), spontaneously activated attitudes, such as those assessed by implicit measures, shape attention, construal, and behavior. In this regard, there is little but encouraging evidence showing that implicit partner evaluations may affect one's own perception of marital problems over the years (McNulty et al., 2013) or one's own self-reported positive behavioral tendencies toward a romantic partner (LeBel & Campbell, 2013). Nevertheless, in LeBel and Campbell's study, the behavioral index was restricted to three self-perceived cues (i.e., saying something loving, showing interest in partner's day, making an effort to spend time together). Such an index hardly depicts an exhaustive behavioral representation and fails to distinguish spontaneous from deliberate behaviors, which may be crucial to understanding the unique role played by automatic processes (e.g., Dovidio et al., 2002). In sum, extremely little is known about the actual (i.e., objectively assessed) and specific (i.e., spontaneous or deliberative) relational processes that are influenced by implicit partner evaluations in real- life settings.

Implicit Partner Evaluations and Nonverbal Behavior

In line with Fazio's (1990) MODE model, implicit partner evaluations are automatically activated as soon as one's partner is merely encountered and serve as a driving force to elicit spontaneous behaviors, unless individuals are motivated and able to engage in more controlled responses. Over the course of a relationship, romantic partners experience a great deal of dyadic interactions in which they are usually motivated to be constructive and thus override some of their negative reactions. Yet they may not always be able to do so, and implicit attitudes may especially predict behavior when people cannot control their responses. In dyadic interactions, verbal behavior can easily be controlled in compliance with one's goals (Vincent et al., 1979); however, nonverbal behavior is considered as a spontaneous response that people are less capable of effectively monitoring (DePaulo, 1992). Hence, we suggest that implicit partner evaluations are susceptible to influencing spontaneous non- verbal behavior but not deliberate verbal statements that are likely to be determined by more controlled processes (i.e., explicit evaluations; Dovidio et al., 2002). We further assert that the effect of implicit partner evaluations on actual nonverbal behavior can illuminate why such gut feelings have long-term implications on relational outcomes. Indeed, interpersonal behavior is a major determinant of relationship success (Gottman et al., 1998), and although subtle, nonverbal responses fulfill crucial relational functions during romantic communication (Noller, 2006). Consequently, we argue that positive implicit partner evaluations may be especially powerful predictors of positive relationships' long-term outcomes because they regularly promote more constructive nonverbal behavior in daily life.

Research Overview

To date, the reasons why implicit partner evaluations influence long-term relationship outcomes are unclear, and no study has investigated their short-term effects on actual behavior in dyadic interactions. To address this question, we conducted an intensive longitudinal project in which we videotaped couples discussing a topic on which their interests diverged, after which they completed an 8-day diary. We hypothesized that positive implicit partner evaluations would predict constructive nonverbal (but not verbal) behavior during the conversation. We further predicted that the more constructive nonverbal responses individuals display, the more satisfied they would be with their conversation and their relationship in general over time. Finally, we explored whether these processes also affect their partners' outcomes and behaviors. Material, syntax, and data (with restricted access given the sensitive nature of our dyadic sample of romantic couples) for this project are available at https://osf.io/75qw6/.

METHOD

Participants

Participants were 129 heterosexual couples and 1 homosexual couple[17] (N = 260 individuals). In line with recent guidance (Finkel et al., 2015), as well as with recruitment and financial constraints, the sample size was decided prior to data collection on the basis of the large sample sizes used in previous relationship studies (e.g., (McNulty et al., 2013) and combined with a diary design to maximize statistical power. All participants were recruited in The Netherlands via personal approach or through various websites and social networks. They were required to speak fluent Dutch, be childless, and be involved in a romantic relationship that has lasted a minimum of 4 months. An incentive of €80 was granted for participating in the intake part of the study and responding to at least 80% of the diary signals. Participants were also given the chance to win a €200 bonus in a raffle at the end of the study.

Two couples and 1 participant failed to follow instructions at intake. Their data were excluded from all analyses of this data set (e.g., Righetti et al., 2016; for an exhaustive overview of past publications using this data set, see the Supplemental Material available online). The remaining sample included 255 participants whose age ranged from 18 to 43 years (M = 23.31, SD = 3.64). At intake, relationship length varied from 4 months to 17 years (M = 33.91 months, SD = 29.01); 34% of the couples were living together, and 2.4% of them were married. Moreover, 63.9% of the participants were students, 33.7% were full-time workers, and 2.4% were both working and studying.

Procedure

Couples were asked to come to the lab for the intake portion of the study. After signing a consent form, partners were separated to different cubicles and asked to complete a task assessing implicit partner evaluations and reply to several questionnaires. Next, partners were reunited in one room and asked to discuss a current divergence of interest between them while being videotaped. A divergence of interest was defined as one in which both partners had different preferences (e.g., one partner likes to visit his or her family on the week- ends but the other prefers to spend time with common friends, or one partner wishes to watch an action movie but the other wants to watch a panda documentary). They were instructed to discuss this divergence of interests for 7 min as they would normally do at home and to do so by trying to come up with a solution. After ending the conversation, couples received both verbal and written instructions about the diary procedure, which always started on the upcoming Saturday. Every evening for 8 days after 9:00 p.m., participants received an e-mail containing a link that directed them to a Qualtrics survey. They were asked to fill out a questionnaire about what happened during

17 This sample was part of a larger project addressing different research questions, which do not theoretically nor empirically overlap with the current article, and, thus, will not be further discussed.

the day. On average, participants replied to 90.9% of the diary signals. At the end of the study, participants were thanked and debriefed.

Measures

Implicit partner evaluations. In the lab, participants first performed a Single Category Implicit Association Test (SC-IAT; Karpinski & Steinman, 2006), which measured their implicit partner evaluations. The SC-IAT is a computer-based behavioral test that is especially suited to assess the strength of the mental associations with a single attitude object (e.g., romantic partner) that does not have an obvious complementary category (e.g., unspecified nonromantic partner) or for which it is simply not appropriate to be interpreted in comparison to another category (see Karpinski & Steinman, 2006). In this study, participants performed the SC-IAT on a desk- top computer using Inquisit 4 Lab (Millisecond, 2015). They were told that words representing the categories *positive, negative*, or *partner* would be sequentially displayed in the center of the screen. Their task was to indicate whether these target words belonged to a category located on the top left (response key "E") or top right corner of the screen (response key "I"). They were instructed to go as fast as they could while making as few mistakes as possible (an error message was displayed every time they failed to do so correctly). We used 45 different target words: The original 21 positive and 21 negative words used by Karpinski and Steinman (2006) and 3 partner-related words (the partner's first name, last name, and nickname—all provided by the participants prior to starting the test).

Following Karpinski and Steinman's procedure, we divided this SC-IAT into two blocks, the presentation order of which was counterbalanced between participants. In the compatible block, the partner and positive categories were paired together on the same side of the screen. In the incompatible block, the partner category was paired with the negative category. For each block, there were 24 practice trials and 72 test trials (with an identical proportion of target words presented per category in random order). Finally, to determine the internal consistency of the SC-IAT, we used a split- third method with Spearman-Brown correction (see Karpinski & Steinman, 2006), which revealed an acceptable reliability (adjusted $r = .79$).

Relationship satisfaction. Explicit levels of relationship satisfaction were assessed at three different time points. First, at intake, participants indicated their general level of relationship satisfaction on a four-item scale ($\alpha = .82$; Rusbult et al., 1998), which included statements such as "My relationship is close to ideal," by using a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*). Because this scale measured how partners explicitly evaluated their overall relationship satisfaction at intake, we will use the term *explicit relationship evaluation* to refer to this measure. Second, at the end of the conversation, relationship satisfaction was assessed by a single item ("I feel satisfied with our relationship") on a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*). Third, in the diary portion of the study, participants self-reported their daily level of relationship satisfaction every evening for 8 days on the same item by using a 7-point Likert scale (0 = *strongly disagree*, 6 = *strongly agree*).

Satisfaction with conversation solution. At the end of the interaction, participants were asked to indicate how satisfied they felt with the solution they came up with (one item; "I am satisfied with the solution that we reached during the conversation") on a 7-point Likert scale (1 = *not at all*, 7 = *completely*).

Videotaped conversation. At Intake, once couples completed the implicit and explicit measures, they were invited to discuss a topic on which their interests diverged for 7 min. Their conversation was videotaped to record both partners' verbal and nonverbal behaviors. Verbal and nonverbal behaviors exhibited during the conversation were coded by trained raters. The 7-min conversations were first divided into 14 sequences of 30 s each. Then, for each 30-s sequence, raters were instructed to code separately the positivity and negativity of the behaviors expressed by each partner on two independent 7-point Likert scales (e.g., "How would you evaluate the positivity of the nonverbal behaviors exhibited by the partner located on the left in this sequence?" and "How would you evaluate the negativity of the verbal behaviors stated by the partner A in this sequence?" 0 = *none/ neutral*, 6 = *very high*). Nonverbal behaviors were coded by three non-Dutch raters with no understanding of the Dutch language so that they could not be influenced by the verbal content of the conversation. Similarly, to limit nonverbal influences (e.g., body gesture, tone of voice) that would interfere with the verbal coding, we first transcribed verbal behaviors from the videos, and these texts were then read and coded by three Dutch raters. Inspired by previous coding schemes (e.g., Kerig & Baucom, 2004), we asked both verbal and nonverbal coders to evaluate the negativity of the conversation in three subcategories (hostility, withdrawal, dysphoric affect) and the positivity of the conversation in two subcategories (openness, humor/positive affect).

We used two-way random intraclass correlation coefficients (ICCs) as indexes of consistency to assess the reliability of the coders' mean ratings (Shrout & Fleiss, 1979). The coding of both verbal and nonverbal raters showed satisfying reliability, ICC(2, 3) = .80 and ICC(2, 3) = .75, respectively. More specifically, the reliability for verbal negativity was ICC(2, 3) = .81, and the reliability for verbal positivity was ICC(2, 3) = .67. The reliability for nonverbal positivity and negativity was ICC(2, 3) = .82 and ICC(2, 3) = .54, respectively. Although lower reliability indexes are to be expected when coding complex interpersonal behaviors (e.g., (Dovidio et al., 2002), all the present estimates ranged from fair to excellent (Cicchetti, 1994). Moreover, additional Bland-Altman plots (Bland & Altman, 1986) corroborated that agreement between raters was satisfactory when compared two by two (see the Supplemental Material).

RESULTS

Analytic Strategy

We used multilevel modeling with random intercepts and fixed slopes to take into account the nonindependent nature of our data (participants nested within couples and multiple time measurements within participants in the diary part of the study; Kenny et al., 2006). Because gender did not reliably moderate our effects (and given that one couple was homosexual), we treated dyads as indistinguishable (Kenny et al., 2006). Given the nested nature of our data, we report standardized coefficients as effect-size estimates.

SC-IAT scores were computed on the basis of the scoring algorithm from Karpinski and Steinman (2006). That is, for each participant, practice trials were dis- carded, responses faster than 350 ms and slower than 10,000 ms were eliminated (0.19% of the data)[18], and error responses were replaced with the participant's block mean and a penalty of 400 ms. Next, we subtracted the average response latencies of the compatible block from the incompatible block and, finally, divided this value by the participant's standard deviation for all correct response latencies. Nine participants failed to provide a partner's nickname, and another showed an error response rate greater than 20%. Moreover, four couples did not take part in the conversation, and three others did not comply with the instructions (failed to come up with or discuss a topic on which their interests diverged). Consequently, we removed these participants from the corresponding analyses.

We did not expect implicit partner evaluations (or explicit relationship evaluation) to influence one dis- tinct valence of the nonverbal (or verbal) behavior differently from the other. Rather, we posit that when discussing a heated topic, higher levels of implicit (or explicit) evaluations would lead to more constructive nonverbal (or verbal) behavior, which can be under- stood as a larger proportion of positivity than negativity expressed through numerous cues. Moreover, we argue that regardless of the magnitude of each valence, it is the relative difference between positivity and negativity that is likely to influence later relational outcomes. Conversely, we believe that focusing on one isolated valence might bias and restrict our understandings of automatic processes in dyadic interactions because both positivity and negativity can be adequately interpreted only when considered together. Therefore, for both verbal and nonverbal behaviors, we first computed an index of positivity and negativity by averaging the raters' 30-s coding for these two dimensions. Then we created difference scores by subtracting scores of negativity from those of positivity (higher scores indicate more positivity than negativity). Although we did not expect valence to moderate our effects, we nevertheless report exploratory moderation analyses later in this section and provide ancillary results considering positivity and negativity separately in the Supplemental Material for interested readers.

18 Similar results were obtained when using a more conservative upper cut-off threshold of 3,000 ms.

Finally, as a bootstrapping method, we used the Monte Carlo method for assessing mediation—with unstandardized estimates, 20,000 simulations, and 95% confidence intervals (CIs; Selig & Preacher, 2008)—to estimate the indirect effect of implicit partner evaluations on relational outcomes through nonverbal behavior. Coefficients for indirect effects were computed by multiplying path *a*'s and path *b*'s unstandardized estimates. Moreover, to ensure that our effects elicited changes in relationship satisfaction, we performed time-lagged regression analyses in which we controlled for initial levels of romantic satisfaction reported at intake (on the same item or scale to warrant a fair comparison).

Preliminary Analyses

At intake, participants generally showed positive implicit partner evaluations (M = 0.21, SD = 0.33, 95% CI = [.16, .25]), meaning that they were faster in categorizing words when partner words were matched with positive words as compared with negative words, $t(246)$ = 9.75, 95% CI for the mean difference = [0.16, 0.25], $p < .001$ (one-sample t test against zero). In line with previous research (e.g., Hicks et al., 2020; McNulty et al., 2013), implicit partner evaluations were not significantly related to explicit relationship evaluations (M = 5.97, SD = 0.83) at baseline, b = 0.14, SE = 0.15, 95% CI = [–0.14, 0.43], p = .328, β = 0.06. One-sample t tests against zero revealed that during the conversation, participants exhibited greater positivity than negativity in their verbal (M = 0.95, SD = 0.86) and nonverbal (M = 0.47, SD = 0.87) behaviors, $t(245)$ = 17.21, 95% CI for the mean difference = [0.84, 1.06], $p < .001$, and $t(245)$ = 8.46, 95% CI for the mean difference = [0.36, 0.58], $p < .001$, respectively. Moreover, partners' verbal statements, $r(123)$ = .42, 95% CI = [.26, .56], $p < .001$, and nonverbal cues, $r(123)$ = .68, 95% CI = [.57, .77], $p < .001$, were positively correlated with each other. Thus, the more constructive individuals were in their verbal and nonverbal behavior, the more constructive their partner was, too. However, interestingly, there was no significant association between the participant's verbal and nonverbal behaviors, $r(246)$ = .07, 95% CI = [–.06, .19], p = .301, which underlines the importance of coding both behaviors separately. Furthermore, positivity and negativity for both verbal and nonverbal behaviors were moderately correlated, $r(246)$ = –.38, 95% CI = [–.48, –.27], $p < .001$, and $r(246)$ = –.34, 95% CI = [–.45, –.23], $p < .001$, respectively.

Implicit Partner Evaluations and Nonverbal Behaviors

To investigate the link between implicit partner evaluations and behaviors exhibited in the conversation, we first ran a series of multilevel analyses. Consistent with our hypothesis, results revealed that participants' implicit partner evaluations were associated with their nonverbal behavior, b = 0.34, SE = 0.12, 95% CI = [0.10,0.59], p = .007, β = 0.13. That is, the more participants automatically associated their partner with positivity (rather than negativity) at intake, the more they exhibited constructive nonverbal cues when interacting with their partner, and this occurred even after we controlled for their explicit relationship evaluation, b = 0.34, SE = 0.13, 95% CI = [0.09, 0.58], p = .008, β = 0.13. In

line with our reasoning, results showed no link between participants' implicit partner evaluations and their verbal behavior, $b = -0.01$, $SE = 0.15$, 95% CI = [−0.31, 0.30], $p = .962$, $\beta = -0.003$. Conversely, and as predicted, the explicit relationship evaluation assessed at intake was not related to nonverbal behavior exhibited in the conversation, $b = 0.05$, $SE = 0.06$, 95% CI = [−0.07, 0.16], $p = .411$, $\beta = 0.05$. Interestingly, however, participants' explicit relationship evaluation did not predict their verbal behavior either, $b = -0.002$, $SE = 0.07$, 95% CI = [−0.13, 0.13], $p = .979$, $\beta = -0.002$.

Next, to more directly test whether the association between implicit partner evaluations and nonverbal behavior was significantly different from the corresponding association involving verbal behavior, we nested both behaviors within participants and created a new variable coded −1 for verbal scores and +1 for nonverbal ones. Consistent with our expectations, results showed that individuals' implicit partner evaluations did not predict general behaviors (i.e., verbal and nonverbal clustered together) in the conversation, $b = 0.15$, $SE = 0.10$, 95% CI = [−0.05, 0.35], $p = .144$, $\beta = 0.05$. However, results revealed a marginally significant interaction between implicit partner evaluations and type of behavior, $b = 0.18$, $SE = 0.10$, 95% CI = [−0.01, 0.38], $p = .066$, $\beta = 0.07$. That is, participants' implicit partner evaluations were significantly associated with their spontaneous nonverbal behavior in dyadic interactions, $b = 0.33$, $SE = 0.14$, 95% CI = [0.06, 0.61], $p = .019$, $\beta = 0.12$, but not their controlled verbal statements, $b = -0.03$, $SE = 0.14$, 95% CI = [−0.31, 0.24], $p = .808$, $\beta = -0.01$.

Finally, although we did not have a priori predictions on how the specific valence of the behavior (i.e., positivity or negativity) would affect our results, we also conducted some exploratory analyses to assess whether the relationship between implicit partner evaluations and nonverbal behavior was moderated by valence. As in the previous analyses, we nested both nonverbal positivity and negativity within individuals and created a new valence variable (coded −1 for negativity and +1 for positivity). Although the main effect of implicit partner evaluations on nonverbal behavior remained significant, $b = 0.18$, $SE = 0.06$, 95% CI = [0.06, 0.30], $p = .004$, $\beta = 0.02$, results also revealed a marginally significant interaction effect, $b = 0.10$, $SE = 0.06$, 95% CI = [−0.01, 0.21], $p = .06$, $\beta = 0.01$. Simple-slopes analyses showed that implicit partner evaluations were especially related to nonverbal positivity, $b = 0.27$, $SE = 0.08$, 95% CI = [0.12, 0.43], $p < .001$, $\beta = 0.03$, but not negativity, $b = 0.07$, $SE = 0.08$, 95% CI = [−0.09, 0.22], $p = .392$, $\beta = 0.01$; though this last result may be due to the weaker reliability of nonverbal negativity ratings. Conversely, valence did not moderate the relationship between explicit relationship evaluation and verbal behavior, $b = -0.03$, $SE = 0.03$, 95% CI = [−0.08, 0.03], $p = .301$, $\beta = -0.01$ (see the Supplemental Material for ancillary analyses per valence).

Mediation by Nonverbal Behavior

We further tested whether the nonverbal behavior exhibited in the conversation mediated the relationship between implicit partner evaluations and satisfaction with the conversation solution and with the relationship[19] (following the conversation and in the diary part of the study). All results are displayed in Table 1. We performed mediation analyses even in the absence of significant total effects in the first place, as there is a large consensus that this criterion should not be considered a necessary prerequisite for mediation tests, especially when the relationships between variables are theoretically guided and assumed to be subtle (Hayes, 2009; Shrout & Bolger, 2002).

For satisfaction with the conversation solution, mediation analyses showed a significant indirect effect through nonverbal behavior. Importantly, this result was also significant when analyses controlled for baseline explicit relationship evaluation, b = 0.10, 95% CI = [0.02, 0.20]. Thus, greater implicit partner evaluations were indirectly associated with greater satisfaction with the conversation's outcome (M = 5.08, SD = 1.50) through more constructive nonverbal cues enacted in the conversation.

Next, we tested our mediation model on relationship satisfaction reported after the conversation. Results revealed a significant indirect effect through nonverbal behavior, which remained significant when analyses controlled for initial levels of romantic satisfaction, b = 0.03, 95% CI = [0.001, 0.079]. Thus, when discussing a heated topic, participants with higher implicit partner evaluations exhibited more constructive nonverbal behavior and in turn reported that they felt even more satisfied with their partner (M = 6.50, SD = 0.68).

Finally, we further examined the effect of implicit partner evaluations and nonverbal behavior on relation- ship satisfaction over the following week in the diary part of the study. Mediation analyses yielded a significant indirect effect through nonverbal behavior. Importantly, this indirect effect held when we included baseline romantic satisfaction in the model, b = 0.04, 95% CI = [0.002, 0.091], although the direct effect of implicit partner evaluations remained significant as well, b = 0.30, SE = 0.12, 95% CI = [0.07, 0.53], p = .012, β = 0.10. Thus, implicit partner evaluations were positively associated with relationship satisfaction over the course of time (M = 5.20, SD = 1.02), and this effect appeared to be partly explained by a more constructive nonverbal behavior exhibited in the dyadic interaction 1 week earlier.

Partner's Outcomes

We further ran exploratory analyses to investigate whether implicit partner evaluations and constructive nonverbal behavior would also affect partners' reports[20] of satisfaction. The empirical evidence collected thus far indicates that implicit partner evaluations

19 Implicit partner evaluations marginally predicted relationship satisfaction assessed in a 1-year follow-up, β = 0.13, 95% CI = [−0.002, 0.665], p = .052, but not when we controlled for baseline satisfaction, β = 0.08, 95% CI = [−0.12, 0.54], p = .206. We report these results for transparency only, as they fall beyond the proximal influences investigated in this article.

20 We thank one reviewer for this suggestion.

Table 1. Results of Multilevel Mediation Models for the Effect of Implicit Partner Evaluations on Relational Outcomes Through Nonverbal Behavior

	Individual's parameters					Controlling for baseline satisfaction				
Model	***b***	***SE***	***95% CI***	***p***	**β**	***b***	***SE***	***95% CI***	***p***	**β**
Satisfaction with conversation solution										
NVB	0.32	0.11	[0.09, 0.54]	.006	0.18	0.31	0.11	[0.08, 0.53]	.008	0.18
IPE										
Total effect	-0.34	0.23	[-0.80, 0.12]	.145	-0.07	-0.37	0.23	[-0.83, 0.09]	.113	-0.08
Direct effect	-0.45	0.24	[-0.92, 0.02]	.061	-0.10	-0.49	0.24	[-0.96, -0.01]	.044	-0.11
Indirect effect	0.11		[0.02, 0.21]			0.10		[0.02, 0.20]		
Relationship satisfaction after conversation										
NVB	0.12	0.05	[0.02, 0.23]	.025	0.16	0.10	0.05	[0.01, 0.19]	.037	0.13
IPE										
Total effect	0.15	0.12	[-0.08, 0.38]	.211	0.07	0.10	0.11	[-0.12, 0.32]	.355	0.05
Direct effect	0.11	0.12	[-0.13, 0.35]	.363	0.05	0.07	0.11	[-0.16, 0.29]	.554	0.03
Indirect effect	0.04		[0.003, 0.092]			0.03		[0.001, 0.079]		
Relationship satisfaction Diary										
NVB	0.14	0.06	[0.02, 0.26]	.019	0.12	0.12	0.05	[0.01, 0.22]	.035	0.10
IPE										
Total effect	0.33	0.12	[0.09, 0.56]	.006	0.11	0.33	0.12	[0.10, 0.56]	.005	0.11
Direct effect	0.29	0.12	[0.05, 0.53]	.017	0.10	0.30	0.12	[0.07, 0.53]	.012	0.10
Indirect effect	0.05		[.01, .11]			0.04		[0.002, 0.091]		

Note. The table shows parameters for predictors of each of the three relationship-satisfaction outcomes with and without controlling for baseline relationship satisfaction. CI = confidence interval.

exclusively predict actors' perceptions of relational outcomes over time (e.g., McNulty et al., 2013). To our knowledge, however, nothing is known about the effect of the actor's implicit partner evaluations on the partner's outcomes. One reason why may be that individuals' own implicit self-evaluations (McNulty et al., 2014) and own emotional experiences that become associated with their partner (Hicks et al., 2016; McNulty et al., 2017) shape their own implicit partner evaluations, which therefore strongly influence their own outcomes over time (McNulty & Olson, 2015) but not necessarily those of their partner, which are more likely to be determined by their own implicit evaluations. Yet, following the idea that more positive implicit partner evaluations promote constructive nonverbal behaviors in dyadic interactions, one may expect that partners could also be positively affected by these behaviors. However, if such influences result from more constructive nonverbal interactions, they should affect relational outcomes that are related to the interaction itself more strongly than those assessed later.

Table 2. Indirect Effects of Actor's Implicit Partner Evaluations on Partner's Relational Outcomes Through Actor's Nonverbal Behavior

	Mediation model		Controlling for partner's baseline satisfaction	
Partner's Outcome	***b***	***95% CI***	***b***	***95% CI***
Satisfaction with conversation solution	0.08	[0.01, 0.18]	0.08	[-0.002, 0.166]
Relationship satisfaction after conversation	0.04	[0.01, 0.10]	0.03	[-0.001, 0.074]
Relationship satisfaction Diary	0.02	[-0.02, 0.07]	0.02	[-0.01, 0.06]

Note. CI = confidence interval.

As reported in Table 2, we tested whether the actor's nonverbal behavior mediated the relationship between the actor's implicit partner evaluations and his or her partner's outcomes. Results revealed significant indirect effects for both partner's satisfaction with the conversation solution, $b = 0.08$, 95% CI = [0.01, 0.18], and their relationship after the conversation, $b = 0.04$, 95% CI = [0.01, 0.10], though these effects did not remain significant when analyses controlled for partner's baseline satisfaction. Such findings suggest that actors' implicit partner evaluations may not only serve their own relational well-being by promoting more constructive nonverbal cues but may also, to a lesser extent, indirectly benefit their partner. However, these influences appeared to be confined to the context of the conversation, as the indirect effects were not significant in the diary portion of the study (see the Supplemental Material for detailed results).

Finally, to further understand how the partner's outcomes and behaviors are influenced by the actor's evaluations and behaviors, we conducted three series of exploratory mediation analyses. First, we tested whether the actor's implicit partner evaluations influenced the actor's nonverbal behavior, which in turn influenced the partner's nonverbal behavior. Although the indirect effect was significant, $b = 0.22$, 95% CI = [0.07, 0.38], it did not hold when we controlled for the partner's implicit partner evaluations, $b = 0.18$, 95% CI

= [−0.04, 0.40]. Second, we examined whether the actor's nonverbal behavior influenced his or her partner's nonverbal behavior, which in turn influenced the partner's satisfaction. Results revealed significant indirect effects for partners' satisfaction with the conversation solution and the relationship as discussed in the diary, b = 0.15, 95% CI = [0.01, 0.28], and b = 0.09, 95% CI = [0.01, 0.16], respectively, even when we controlled for partners' baseline satisfaction, b = 0.14, 95% CI = [0.001, 0.270], and b = 0.08, 95% CI = [0.001, 0.140], respectively. However, this indirect effect was not significant when we considered relationship satisfaction after the conversation as the outcome variable, b = 0.05, 95% CI = [−0.03, 0.11].

Last, we tested whether the actor's nonverbal behavior influenced the partner's nonverbal behavior, which in turn affected the actor's satisfaction. The only significant indirect effect was observed for satisfaction with the conversation solution, b = 0.16, 95% CI = [0.01, 0.29], although this effect was no longer significant when we controlled for actors' initial relationship satisfaction, b = 0.14, 95% CI = [−0.002, 0.27]. In sum, participants' nonverbal behaviors and relational out- comes were predominantly predicted by their own implicit partner evaluations and were not consistently associated with their partner's implicit evaluation or their partner's nonverbal behavior.

DISCUSSION

The present research integrated perspectives from interpersonal processes and social cognition to investigate how implicit partner evaluations affect dyadic interactions. In an observational and a diary study involving romantic couples, results showed that more positive implicit partner evaluations related to more constructive nonverbal behavior toward the romantic partner. Consequently, those spontaneous behaviors were associated with higher satisfaction with the discussion's outcome and the relationship up to 1 week later. All the aforementioned findings held when we controlled for initial explicit relationship satisfaction, which did not predict verbal or nonverbal behaviors. Finally, the link between implicit partner evaluations and partners' behaviors and outcomes did not consistently emerge in our data.

Our study considerably extends previous research that examined the association between implicit evaluations and interpersonal behaviors. Existing work has mainly, if not uniquely, focused on how implicit attitudes toward a group influence behaviors toward a stranger (i.e., an exemplar of the group) in a single laboratory occasion (e.g., Dovidio et al., 2002). To our knowledge, we provide novel evidence that implicit evaluations of a close other reliably predict spontaneous behaviors toward that specific person. Importantly, by comparison with prior research, our results demonstrate that such effect operates even in a highly decisive context: when partners try to discuss divergent interests that they currently face in their relationship and that have the potential to impact their long-term personal and relational well-being. Indeed, our study suggests that more positive implicit partner

evaluations and constructive nonverbal behavior may affect the actual relationship beyond the interaction by gradually improving daily relational satisfaction over the following week.

The current research also provides important insights into key processes of dyadic communication. For decades, researchers have principally studied how self-reported traits and dispositions affect the outcomes of behavioral interactions (see Baldwin et al., 2010). Our work, instead, shows that the source of successful communication may be deeply rooted in automatic affective associations, which may be distinct and separable from self-report evaluations. Furthermore, the overwhelming majority of the coding systems used to measure behaviors in interactions rely on categories that predominantly favor verbal over nonverbal components (e.g., (Kerig & Baucom, 2004). In contrast, the current work highlights the benefits of adopting a continuous fine- grained coding system that distinguishes between these two behaviors, as they seem to represent distinct processes and have different consequences. Importantly, while prior research has largely focused on the role of controlled behaviors in regulating dyadic interactions, the unique link between implicit partner evaluations and nonverbal behavior reveals that relational outcomes may be impacted by behavioral responses that might slip from individuals' control. Such findings emphasize the importance of automatic processes for understanding the sources and consequences of romantic communication and for improving dysfunctional interactions (e.g., couple therapies).

Our findings thus provide long-awaited evidence that the reasons why implicit partner evaluations predict relationship outcomes in the long run may rest on their influences on automatic behaviors in daily dyadic inter- actions. Because one unique aspect of romantic dyads is that partners are very spontaneous toward each other (Collins & Feeney, 2000), nonverbal behavior stands out as a powerful interpersonal process through which implicit partner evaluations exert their influences on relational outcomes over time. How does this process occur? It may be possible that one's constructive nonverbal behavior may also affect the partner's behavior, which could then make the overall discussion smooth and make people aware that their relationship is good. However, this dyadic perspective is only partially supported by our data. Another possibility may be that in the short run, individuals may interpret their relationship in light of the micro-expressions and emotions they spontaneously exhibit toward their partner (e.g., Niedenthal, 2007), which are initially triggered by their implicit partner evaluations. For instance, people having more positive implicit partner evaluations would be more likely to enact smiles and approach behaviors, which may elicit positive emotions and in turn make them perceive their interaction as more satisfying. Thus, in the long run, implicit partner evaluations may influence explicit evaluations by the inferences that people draw from their nonverbal behavior toward their partner. Although these interpretations remain speculative, they provide fruitful avenues for future research.

An important limitation is that our findings are correlational, and therefore caution is advised when drawing causal conclusions; however, our longitudinal design and lagged analyses alleviate some concerns regarding causal direction. Nonetheless, our work also carries several strengths that follow recent recommendations for improving research

practices (Finkel et al., 2015). Whereas the predictive power of self-report measures has been challenged (Joel et al., 2017), the present multimethod approach provides new insights that may help relationship research move forward. First, we showed the importance of using a reliable implicit measure to assess automatic affective responses involving one's partner that predict both immediate and subsequent relationship outcomes. Second, we gathered objective ratings of behavioral interactions according to a newly developed fine-grained coding system (see https://osf.io/xtyfa/). Finally, we collected data of real-life experiences from a large dyadic sample through a diary procedure that provides clear and ecologically valid evidence that positive implicit partner evaluations may promote flourishing relationships over time via spontaneous dyadic processes, such as constructive nonverbal behavior.

Chapter 4

When and for Whom Implicit Partner Evaluations Predict Forgiveness

This chapter is based on Faure, R., Righetti, F., Larson, G., Cuellar, M. F., Koutsoumpis, A., Zwicker, M., & Hofmann, W. (2020). When and for Whom Implicit Partner Evaluations Predict Forgiveness. *Social Psychology and Personality Science*. doi: 10.1177/1948550620936476

ABSTRACT

Recent work suggests that implicit partner evaluations have long-term implications for relationship success. However, little evidence shows *whether* and *under which conditions* implicit partner evaluations affect relationship-maintenance processes in daily life, especially those exhibited in situations that may be highly decisive for the fate of the relationship, such as when partners hurt each other. Drawing upon dual-process theories, we predicted that, when executive control is limited—either as a trait or a state—people's implicit partner evaluations influence forgiveness toward their partner. Results revealed that when temporarily impairing people's executive control with an experimental manipulation (Study 1), or for people with lower trait executive control (Study 2), more positive implicit partner evaluations were associated with more forgiveness, both in laboratory settings and in an 8-day diary. These findings highlight the importance of implicit partner evaluations under specific, yet common, conditions for promoting reparatory responses that are key to relationship success.

Keywords: implicit partner evaluations, forgiveness, executive control, dual-process theories, close relationships.

Forgiveness is a keystone process to maintaining relational harmony with important others, especially romantic partners (McCullough et al., 2000), and to promoting psychological well-being (Karremans et al., 2003). For decades, research has studied forgiveness as being the result of effortful and deliberate cognitive processing (Burnette et al., 2014). However, real-life situations in which partners possess sufficient executive control to engage in deliberate processes appear scarce (Hofmann et al., 2012; Miyake & Friedman, 2012) and therefore, oftentimes, forgiveness may occur in an effortless and impulsive fashion (Karremans & Aarts, 2007). Yet, nothing is known about the factors that promote forgiveness when executive control is low.

Drawing upon theories of implicit social cognition, we propose that implicit partner evaluations—the automatic affective reactions to one's partner—may advance our understanding of forgiving behavior. Growing evidence indeed shows that implicit partner evaluations predict long-term relationship success (McNulty et al., 2013), notably because they likely influence behavior when people do not have the ability to engage in more deliberate reasoning (Hicks & McNulty, 2019). Thus, we posit that, under low executive control, implicit partner evaluations predict forgiveness toward the partner.

Implicit Partner Evaluations

Flourishing relationships are important for people's mental and physical well-being (Proulx et al., 2007; Robles et al., 2014). However, research repeatedly shows that maintaining

mutually satisfying relationships is particularly difficult because romantic satisfaction inevitably decreases as time goes by (Amato & James, 2010; Lavner & Bradbury, 2010; McNulty et al., 2013). Given the substantial practical implications for our societies, it appears theoretically and practically relevant to identify which factors may help romantic partners to maintain thriving relationships.

In this regard, recent work has found that implicit partner evaluations are unique determinants of long-term relationship satisfaction (McNulty et al., 2013, 2017), break-up likelihood (LeBel & Campbell, 2009; Lee et al., 2010), and even mental health (McNulty et al., 2019). These spontaneous affective reactions toward one's partner seem to reflect a stable summary of people's past romantic experiences with their partner (Hicks et al., 2016; Murray et al., 2010). Interestingly, implicit partner evaluations appear weakly associated—if at all—with more explicit self-reported evaluations (Hicks et al., 2020; Scinta & Gable, 2007). Indeed, when asked explicitly, people often engage in motivated reasoning to see their relationship partner in an overly positive light (Murray, 1999). As a result, not only does this deliberate processing disconnect people's explicit evaluations from their spontaneous affective reactions, but it also restricts the long-term predictive validity of explicit measures. Crucially, implicit partner evaluations, as assessed by implicit measures, appear much less affected by such motivational biases and, thus, predict relationship quality over time, even when explicit evaluations do not (McNulty et al., 2013).

Dual Processes and Executive Control

Nevertheless, little is known regarding the proximal factors that may explain why implicit partner evaluations have long-term implications. The MODE model (*M*otivation and *O*pportunity as *DE*terminants of the attitude-behavior relationship; Fazio & Olson, 2014) posits that implicit partner evaluations are automatically activated upon thinking or encountering the partner to guide behavior toward that partner in an automatic manner, unless people are motivated and cognitively able to engage in more controlled responses. Although people are strongly motivated to regulate their (negative) responses in their relationships (McNulty & Olson, 2015), at times, they may be unable to do so, allowing implicit partner evaluations to predict behavior (Faure et al., 2018).

One important reason why this occurs is because people have limited executive control. Executive control, as assessed by performance-based measures (e.g., cognitive tasks), is defined as the cognitive ability to regulate one's behavior (Duckworth & Kern, 2011; Toplak et al., 2013). Crucially, individuals differ significantly in trait executive control (Miyake & Friedman, 2012) and, consequently, people with lower cognitive ability are more likely to behave in an impulsive and automatic way. Consistent with this idea, previous research found that for people with lower working memory capacity, more positive implicit partner evaluations predicted more resilience when expecting critiques from the partner (Murray et al., 2012).

Furthermore, executive control is also prone to be temporarily impaired by a large range of situational factors (Hofmann et al., 2012). For instance, over the course of their

relationship, romantic partners regularly have to cope with external stress, which inevitably undermines their executive control (Buck & Neff, 2012). Under such circumstances, even individuals high in executive control at a trait level may be temporarily unable to engage in effortful considerations, and thus, to override their automatic affective associations. In line with this reasoning, there is evidence that when people are under high cognitive load, more positive implicit partner evaluations are associated with more confidence in the partner's closeness and more automatic inclination to approach the partner in the face of relationship threats (Murray, Pinkus, et al., 2011).

Forgiveness

These findings provide encouraging evidence that, when executive control is low, implicit partner evaluations may affect perceptions of and approach-avoidance tendencies toward the partner. Yet these studies do not document whether implicit partner evaluations may also affect more overt responses that are critical for the fate of the relationship. One such response is how people react when their partner hurt them. Indeed, partners inevitably offend each other's feelings over the course of their relationships—such as when they do or say something offensive to each other, when they forget or refuse to do something important for the other, or when they engage in a heated argument with each other. In those situations, avoidance and revenge responses are generally associated with destructive relational dynamics (McCullough et al., 2000), whereas forgiveness is associated with increased intimacy and relatedness (Karremans & Van Lange, 2008), more constructive interactions (Fincham et al., 2004), and higher relationship quality (Paleari et al., 2005).

Relationship research defines forgiveness as being the result of a process of transformation of motivation (Rusbult & Van Lange, 1996). For this process to occur, people must be motivated (Finkel et al., 2002; McCullough, 2008) and cognitively able (Burnette et al., 2014; Pronk et al., 2010) to transform their negative affect into more constructive relationship responses. That is, when executive control is high, deliberate processing allows people to base their forgiveness responses on the integration of various kinds of information, such as their relationship value (van der Wal et al., 2014), the exploitation risks (Burnette et al., 2012), the severity of the transgression (Stanton & Finkel, 2012), the domain of transgression and so forth (Rusbult et al., 1991). However, although it is clear that forgiveness sometimes depends on effortful processing, other work suggest that forgiveness may also occur effortlessly in close relationships (Pronk & Righetti, 2015). In fact, research shows that people seem automatically inclined to forgive close others as compared to non-close others (Karremans & Aarts, 2007) and that the willingness to forgive romantic offenses can arise when executive control is low (Karremans & Aarts, 2007; Stanton & Finkel, 2012). To date, however, the factors driving such effortless forgiveness inclinations remain unknown. Thus, further work is sorely needed to examine what contributes to forgiveness in everyday life when people do not engage in effortful and deliberate reasoning.

Research Overview

The current research aims to fill in these gaps by investigating *whether* and *under which conditions* implicit partner evaluations may promote forgiveness in close relationships. Consistent with dual-process theories (Fazio & Olson, 2014), when people do not have the opportunity to engage in effortful deliberations, their spontaneous affective reactions are likely to guide their behaviors and decisions, all without effort. Thus, we propose that, when executive control is low, implicit partner evaluations will predict forgiveness. Conversely, we do not expect this relationship to emerge when executive control is high—conditions under which forgiveness likely depends on more effortful processing and deeper considerations of other goals and contextual aspects.

Specifically, in two studies, we test *when* and *for whom* more positive implicit partner evaluations promote greater forgiveness toward the partner. In Study 1, we use an experimental manipulation to investigate whether people under cognitively taxing conditions (i.e., low state executive control) are more likely to rely on their implicit partner evaluations to determine their willingness to forgive their close other. In Study 2, we use a daily diary procedure to examine whether people with lower performance-based trait executive control are more likely to rely on their implicit partner evaluations when forgiving their romantic partner in daily life. Given their automatic nature, we expect that these effects are not explained by explicit evaluations of the relationship partner, or by other constructs that have been identified as important determinants of forgiving dispositions, (i.e., self-report self-control, trait aggressiveness, agreeableness, and commitment). Therefore, in both studies, results are reported with and without these covariates. Material, code, and data (with restricted access for our dyadic sample) for this project are available at https://osf.io/whcfx/.

STUDY 4.1

Study 1 examines whether the link between implicit partner evaluations and forgiveness is moderated by state executive control (i.e., how much cognitive ability people have at a particular moment). We predicted that more positive implicit partner evaluations would be associated with more willingness to forgive a close other when people's executive control is temporarily impaired, but not when it is kept intact. Furthermore, we expected that this association would neither be driven by explicit evaluations toward the close other, nor by the type of relationship with that close other. Similarly, because some individuals are more (un)forgiving than others, we measured and controlled for two indicators of (un)forgiving dispositions; namely, self-reported trait self-control (Burnette et al., 2014) and trait aggressiveness (Ross et al., 2007).

Method

Participants. In this study, we recruited as many participants as financial and time constraints allowed. In total, 131 Dutch individuals (88 females) participated in exchange for course credit or financial compensation. Participants' age ranged from 18 to 60 years (M = 22.0, SD = 5.0), and about half of the sample (n = 61) were committed to an exclusive romantic partner. All other participants who took part in the study were asked to think carefully about a significant close other[21] (e.g., best friend) instead of a romantic partner. A one-tailed sensitive power analysis for R^2 increase performed with G*Power 3.1 (Faul et al., 2009) revealed that the current sample would provide adequate power ($\alpha = .05$, $1- \beta > .80$) to detect a small-to-medium effect size ($f^2 > .047$) for one tested predictor in a linear multiple regression with three predictors.

Measures and procedure. Upon arrival to the labs, participants were welcomed and invited to sign an informed consent form. To measure their implicit partner evaluations, we used a Single Category Implicit Association Test (SC-IAT; Karpinski & Steinman, 2006). This computer-based behavioral test has proven to be a valid and reliable tool for assessing trait implicit partner evaluations (Faure et al., 2018). In this task, participants were instructed to indicate as quickly and correctly as possible to which category (i.e., positive, negative, partner) the target words sequentially presented on the screen belonged to. Target words were 21 positive, 21 negative, and 3 partner-related words (participants provided their partner's first name, last name, and nickname—or alternatively, their initials—before the task). Following Karpinski and Steinman's (2006) procedure, participants performed two blocks of 96 trials each (both including 24 practice trials). One block in which the category *Partner* was paired with *Positive* on the same side of the screen (compatible block), and another block in which the categories *Partner* and *Negative* were paired together (incompatible block). Thus, faster responses in the compatible block than in the incompatible reflected more positive implicit partner evaluations scores (see Supplemental Material for details about the scoring procedure). Next, as previously noted, we assessed other constructs to rule out alternative explanations to our findings. That is, participants completed a 5-item explicit partner evaluations scale, the Self-Control Scale (11-item SCS; Tangney et al., 2004) and the Brief Aggression Questionnaire (12-item BAQ; Webster et al., 2014).

Thereafter, to manipulate executive control, participants were randomly assigned to a self-control manipulation in which they were asked to watch a short videotape (Schmeichel et al., 2003; see Supplemental Material). During the video, a series of common one-syllable words were sequentially displayed in the bottom right corner of the screen for 30sec each. Half of the participants were asked to focus exclusively on the interviewee and not to read nor to look at any words that may appear on the screen (experimental condition, n = 65), while the other half were not given any instructions nor made aware of the irrelevant words

21 Although half of the sample used a non-romantic partner, we employ *implicit partner evaluations* throughout the manuscript for clarity.

(control condition, n = 66). Crucially, asking participants to consciously manage their attention has been found to lower executive control (Hagger et al., 2010). Supporting our experimental manipulation, participants in the experimental condition were more likely to report watching the entire video from beginning to end than those in the control condition, c^2 (1, N = 131) = 8.28, p = .004, φ = 0.25.

After that, all participants read a transgression scenario in which their close other (e.g., partner or best friend) broke an important promise by not coming to the participant's graduation party and instead attended a concert (see Supplemental Material). Participants indicated that they successfully pictured themselves in the scenario (M = 4.89, SD = 1.55), t(130) = 6.55, 95% CI = [4.62 , 5.15], p < .001, d = 0.57 (one-sample t-test against 4, the scale mid-point). Finally, we used the 18- item Transgression-Related Interpersonal Motivation (TRIM- 18) scale to measure participants' willingness to forgive their close other following that transgression (McCullough et al., 2006). Theoretical and empirical evidence suggests that this scale adequately operationalizes a unidimensional construct that encompasses the three underlying motivations of forgiveness (i.e., avoidance, revenge, and benevolence; see (Burnette et al., 2012; Forster et al., 2019) and provides a reliable and valid assessment of state forgiveness in hypothetical scenarios involving close others (Pronk et al., 2010).

Table 1. Means, Standard Deviations and Correlations for Major Study 1 Variables

Variables	***M***	***SD***	**Reliability**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
(1) IPE	0.20	0.30	.66	.14	-.01	-.10	.08	.07	.22*
(2) EPE	6.46	0.67	.80	—	-.10	-.24**	.04	-.06	.49***
(3) Self-Control	4.05	0.93	.80		—	-.37***	.08	-.05	-.00
(4) Aggression	2.91	0.75	.77			—	-.19*	.08	-.18*
(5) Forgiveness	5.29	0.86	.89				—	.03	-.14
(6) Condition	-0.00	0.50							-.01
(7) Status	-0.03	0.50							

Note. Scores from scales range from 1 to 7. All reliability indices are Cronbach's alphas (α), expect for IPE for which the index of internal consistency for the SC-IAT is an adjusted r as calculated by a split-third method with Spearman-Brown correction (see Karpinski & Steinman, 2006). IPE = implicit partner evaluations; EPE = explicit partner evaluations; Condition = experimental group (coded 0.5) vs. control group (coded -0.5). Status = romantic partner (coded 0.5) vs. important other (coded -0.5). *N*s = 131.
$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Results

All reliabilities, descriptive statistics, and zero-order correlations are reported in Table 1. In Study 1, we estimated three multiple linear regression models using standardized variables. First, to test our main hypothesis, we used implicit partner evaluations scores, a dummy-coded condition variable, and their interaction term to predict forgiveness scores.

In line with our prediction, results revealed a significant interaction[22] between implicit partner evaluations and condition (Model 1 in Table 2). As expected, simple slopes analyses indicated that implicit partner evaluations significantly predicted forgiving responses when participants' executive control was low, β = 0.24, *SE* = 0.12, 95% CI = [0.01, 0.48], *p* = .045, R^2 = .031, but not high, β = -0.11, *SE* = 0.13, 95% CI = [-0.36, 0.14], *p* = .398, R^2 = .005.

Table 2. Results of Multiple Linear Regressions Models Predicting Forgiveness (TRIM-18)

Model	Predictors	β	*SE*	*t*	*df*	*p*	95% CI	R^2
1								.037
	IPE	0.07	0.09	0.77	127	.444	[-0.11, 0.24]	.006
	Condition	0.02	0.17	0.26	127	.799	[-0.30, 0.39]	.001
	IPE*Condition	0.18	0.18	2.00	127	.047	[0.004, 0.696]	.030
2								.043
	IPE	0.06	0.09	0.71	125	.482	[-0.11, 0.24]	.004
	Condition	0.03	0.18	0.28	125	.777	[-0.30, 0.40]	.001
	EPE	0.04	0.09	0.42	125	.675	[-0.14, 0.21]	.001
	IPE*Condition	0.17	0.18	1.86	125	.065	[-0.02, 0.68]	.026
	EPE*Condition	0.07	0.18	0.80	125	.427	[-0.21, 0.49]	.005
3								.139
	IPE	0.08	0.09	0.94	119	.350	[-0.09, 0.26]	.006
	Condition	0.04	0.17	0.51	119	.611	[-0.25, 0.43]	.002
	EPE	0.09	0.10	0.90	119	.368	[-0.11, 0.30]	.006
	Self-Control	-0.02	0.10	-0.18	119	.860	[-0.21, 0.18]	.000
	Aggression	-0.23	0.10	-2.29	119	.024	[-0.42, -0.03]	.038
	Status	-0.25	0.20	-2.53	119	.013	[-0.90, -0.11]	.046
	IPE*Condition	0.18	0.18	2.01	119	.047	[0.01, 0.70]	.029
	EPE*Condition	0.10	0.21	0.99	119	.323	[-0.21, 0.62]	.007
	Self-Control*Condition	0.01	0.20	0.10	119	.923	[-0.37, 0.41]	.000
	Aggression*Condition	0.08	0.20	0.76	119	.446	[-0.24, 0.54]	.004
	Status*Condition	0.04	0.40	0.41	119	.682	[-0.63, 0.96]	.001

Note. IPE = implicit partner evaluations (SC-IAT); EPE = explicit partner evaluations; Condition = experimental group (coded 0.5) vs. control group (coded -0.5); Status = romantic partner (coded 0.5) vs. important other (coded -0.5). All continuous scores were standardized. We calculated the proportion of variance explained by each predictor using model comparison (change in R^2) as effect size estimates.

Second, we tested whether our interaction effect held when controlling for explicit partner evaluations and their interaction by condition (Model 2 in Table 2). Results from this model were similar, though marginally significant: implicit partner evaluations tended to

22 In both studies, secondary analyses showed that our findings were not explained by possible quadratic effects of our continuous predictors (see Supplemental Material).

be more positively associated with forgiveness in the experimental condition, β = 0.23, *SE* = 0.12, 95% CI = [-0.01, 0.47], $p = .063$, $R^2 = .027$, compared to the control condition, β = -0.10, *SE* = 0.13, 95% CI = [-0.36, 0.15], $p = .430$, $R^2 = .005$. Finally, to further examine the robustness of this effect, we controlled for all our covariates[23] and for their interaction by condition to avoid statistical biases in the estimation of coefficients (Yzerbyt et al., 2004). As shown in Table 2 (Model 3), the interaction effect was significant: Participants with more positive implicit partner evaluations were significantly more likely to forgive their close other's transgression in the experimental condition, β = 0.26, *SE* = 0.12, 95% CI = [0.02, 0.50], $p = .034$, $R^2 = .033$, but not in the control condition, β = -0.09, *SE* = 0.13, 95% CI = [-0.35, 0.16], $p = .464$, $R^2 = .006$.

Discussion

The findings of Study 1 provide preliminary support for the idea that, when executive control is low, implicit partner evaluations determine forgiveness. More specifically, when impairing participants' executive control with an experimental manipulation, more positive implicit partner evaluations were associated with more willingness to forgive a close other and, overall, neither explicit partner evaluations nor other confounds seemed to explain this effect. In contrast, there was no significant association between implicit partner evaluations and willingness to forgive for participants who did not experience such impairment. These findings suggest that implicit partner evaluations may have important consequences for relational processes because romantic partners regularly experience situations in which situational stressors tax their executive control (Buck & Neff, 2012). Nevertheless, Study 1 has some limitations. It relied on a relatively modest sample size and it examined the willingness to forgive in an experimental setting rather than actual forgiveness in a natural environment. Thus, in an additional study, we used a daily diary method with a sample size twice as large to corroborate the conclusions drawn from this experiment.

STUDY 4.2

The goal of Study 2 was to replicate and extend the results observed in Study 1. That is, we used a daily diary design involving a large dyadic sample of romantic couples to gain ecological validity and show *for whom* implicit partner evaluations are likely to affect real-life forgiveness. Therefore, Study 2 assessed, rather than manipulated, people's trait executive control using a well-established cognitive task[24] (Stroop, 1935). We expected that

23 The interaction between implicit partner evaluations and condition was not qualified by a three-way interaction with relationship status or self-control (*p*s > .765).

24 Study 2 used the Stroop task because research shows that performance-based measures better capture trait executive control than self-report measures. Consistent with this perspective, self-reported self-control was unrelated to Stroop performance and did not moderate our effect (see Supplemental Material).

implicit partner evaluations would be positively associated with daily-life forgiveness for individuals with low, but not high, trait executive control, and that this association would remain significant when controlling for personal and relational confounding variables.

Participants. Study 2 used an existing dataset of 130 couples (including one same-sex dyad; see Supplemental Material for sample characteristics and previous publications using this dataset). Following current research standards (Finkel et al., 2015), sample size was determined a priori and combined with a diary design to provide adequate statistical power. Participants (N = 260) were recruited in the Netherlands through various methods in exchange for financial compensation. We excluded two couples and one participant who did not comply with the instructions at Intake. The final sample (N = 255) included 63.9% students, 33.7% working adults, and 2.4% of people both working and studying at the same time, whose age varied from 18 to 43 years (M = 23.31, SD = 3.64). On average, relationship duration ranged from 4 months to 17 years (M = 33.91 months, SD = 29.01). Moreover, 34% of the couples were living together, few of whom were married (2.4%).

Measures and procedure. At Intake, couples came to the lab and provided informed consent. Implicit partner evaluations were assessed using the same SC-IAT as in Study 1 (Karpinski & Steinman, 2006). Ten SC-IAT scores were excluded due to failure to comply with the instructions (see Faure et al., 2018). Next, to assess participants' level of executive control, we used a Stroop Task (Stroop, 1935). This task measures participants' response inhibition by requiring them to indicate in which font color the color words are presented on the screen, regardless of whether this font color is congruent or incongruent with the color words. As a result, more difficulty experienced in inhibiting the tendency to respond to the valence of the word reflects lower executive control (see Supplemental Material for details).

Following the reasoning noted earlier, we measured self-reported relationship satisfaction (4-item scale; Rusbult et al., 1998) to ensure that our effects hold over and beyond people's explicit evaluations. Moreover, to control for determinants of forgiving dispositions, we used the same measure of self-control as in Study 1 (Tangney et al., 2004). Likewise, because past research has demonstrated that commitment and agreeableness are important determinants of forgiving inclinations (Finkel et al., 2002; Hilbig et al., 2016), participants completed the 7-item commitment scale (Rusbult et al., 1998) and the 10-item HEXACO agreeableness facet (Ashton & Lee, 2009)

Finally, participants took part in an information session about the 8-day Diary procedure that would follow. On days in which participants encountered a conflicting situation in which their partner made them feel upset, angry, or hurt (k = 962 observations across 232 participants), they were asked to report how quickly they forgave their partner that day (1 item). We focused on this specific aspect because forgiveness should occur in a rather fast and spontaneous manner under low level of executive control. Moreover, forgiveness is

conceptualized as a motivational process that arises specifically from the readiness to forgive (Fincham et al., 2002). That is, being more prone to forgive is assumed to facilitate the process of forgiveness and, thus, to result into quicker and, ultimately, more forgiving responses.

Table 3. Means, Standard Deviations and Correlations for Major Study 2 Variables

Variables	*M*	*SD*	Reliability	(2)	(3)	(4)	(5)	(6)	(7)
(1) IPE	0.21	0.33	.79	-.01	-.18**	.04	.03	.07	.07
(2) Stroop	210.57	148.18	—	—	-.03	-.04	-.08	.01	-.04
(3) Self-Control	4.22	0.93	.77		—	.04	.10	.10	.10
(4) Forgiveness	4.06	1.41	—			—	.03	.18**	.12
(5) Agreeableness	3.96	0.87	.76				—	.04	.11
(6) Commitment	6.47	0.73	.81					—	.53***
(7) Satisfaction	5.97	0.83	.82						—

Note. All scales range from 1 to 7. Descriptive statistics for the Stroop task are latencies in milliseconds. All reliability indices are Cronbach's alphas (α), with the exception of IPE (adjusted *r*; see Karpinski & Steinman, 2006). IPE = implicit partner evaluations; Stroop = Stroop interference; Forgiveness = averaged daily forgiveness (Diary); Satisfaction = explicit relationship satisfaction. *N*s = 225 - 255.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Results

Table 3 provides the main reliabilities, descriptive statistics, and zero-order correlations. Given the nested nature of our data, we used cross-classified two-level multilevel modeling (i.e., participants were nested within dyads and crossed with measurement occasions) with random intercepts and fixed slopes (Kenny et al., 2006). Following Kenny and colleagues' (2006) recommendations, we treated our dyads as indistinguishable because we did not have any theoretical reason to expect different patterns of results for men and women and because gender did not reliably moderate our effects.

Table 4. Results of Multilevel Models Predicting Daily Forgiveness

Model	Predictors	β	*SE*	*t*	*df*	*p*	95% CI
1							
	IPE	0.04	0.05	0.93	154.58	.353	[-0.05, 0.13]
	Stroop	-0.01	0.05	-0.14	168.29	.891	[-0.10, 0.09]
	IPE*Stroop	0.14	0.05	2.85	137.60	.005	[0.04, 0.23]
2							
	IPE	0.03	0.05	0.66	151.98	.513	[-0.06, 0.12]
	Stroop	-0.01	0.05	-0.16	166.87	.871	[-0.10, 0.09]
	Satisfaction	0.06	0.05	1.15	138.04	.252	[-0.04, 0.15]
	IPE*Stroop	0.11	0.05	2.38	134.64	.019	[0.02, 0.21]
	Satisfaction*Stroop	0.06	0.04	1.47	106.89	.144	[-0.02, 0.15]
3							
	IPE	0.04	0.05	0.80	158.03	.425	[-0.06, 0.13]
	Stroop	-0.01	0.05	-0.09	163.46	.928	[-0.10, 0.09]
	Satisfaction	-0.01	0.06	-0.22	140.30	.828	[-0.13, 0.11]
	Self-Control	-0.01	0.05	-0.11	158.57	.913	[-0.11, 0.10]
	Agreeableness	0.02	0.05	0.41	171.42	.679	[-0.08, 0.12]
	Commitment	0.08	0.06	1.44	145.20	.152	[-0.03, 0.20]
	IPE*Stroop	0.12	0.05	2.39	138.55	.018	[0.02, 0.22]
	Satisfaction*Stroop	0.01	0.06	0.14	112.29	.887	[-0.10, 0.12]
	Self-Control*Stroop	-0.07	0.05	-1.35	139.08	.179	[-0.18, 0.03]
	Agreeableness*Stroop	0.01	0.05	0.23	138.54	.817	[-0.09, 0.11]
	Commitment*Stroop	0.07	0.06	1.16	126.10	.247	[-0.05, 0.18]

Note. IPE = implicit partner evaluations (SC-IAT); Stroop = Stroop interference; Satisfaction = explicit relationship satisfaction. All predictors were entered at level 2 (i.e., individual level). We standardized all our variables at a grand-mean level to provide standardized coefficients (β) as effect size estimates.

To investigate our question, we used the same three sets of analyses as in Study 1. First, consistent with our prediction, results revealed that the effect of implicit partner evaluations on daily self-reported forgiveness was significantly moderated by performance on the Stroop task (Model 1 in Table 4). Simple slopes analyses (at +/- 1SD from the mean) indicated that more positive implicit partner evaluations were significantly associated with more forgiving behaviors over the following week for individuals with lower executive control (i.e., higher Stroop interference), β = 0.18, *SE* = 0.07, 95% CI = [0.04, 0.31], $p = .009$, but not for those with higher executive control (i.e., lower Stroop task interference), β = -0.09, *SE* = 0.06, 95% CI = [-0.22, 0.04], $p = .157$.

Next, in an effort to rule out alternative explanations, we tested whether our effect would remain significant when controlling for explicit relationship satisfaction (Model 2)

and for all covariates (Model 3). As shown in Table 4, results were significant and highly similar in both models; controlling for all these covariates, there was a significant positive association between implicit partner evaluations and forgiveness for people with lower executive control, $\beta = 0.16$, $SE = 0.07$, 95% CI = [0.02, 0.30], $p = .028$, but not for higher executive control people, $\beta = -0.08$, $SE = 0.07$, 95% CI = [-0.22, 0.05], $p = .234$.

Discussion

Study 2 replicates and extends previous findings in showing that not only situational characteristics but also individual differences in trait executive control can illuminate when implicit partner evaluations affect actual forgiveness in real-life settings. More specifically, we found that, for people with lower performance-based executive control, more positive implicit partner evaluations were linked to greater forgiveness toward their romantic partners over the following week, even after controlling for several confounds.

GENERAL DISCUSSION

This research investigated under which conditions implicit partner evaluations affect forgiveness in close relationships. Across two studies, we found evidence that more positive implicit partner evaluations promoted more forgiveness when executive control is low, either because of situational characteristics (Study 1), or because of individual traits (Study 2). Importantly, these effects appeared to be unique and largely automatic: they occurred when people had reduced opportunities to engage in effortful cognitive processing (Payne, 2012) and emerged over and above people's explicit evaluations as well as various personal and relational determinants of forgiving predispositions.

These findings resonate quite well with dual-process theories from implicit social cognition research. Indeed, according to the MODE model (Fazio & Olson, 2014), which is the predominant theoretical account on the link between attitude and behavior, implicit evaluations should be especially predictive of behavior when opportunities to deliberate are reduced. That is, when people are undisposed to engage in effortful reasoning, the MODE model posits that people are in fact more likely to act upon their spontaneous reactions rather than to act in a more controlled fashion. Consistent with the pattern of results observed in the present investigation, socio-cognitive research indicates that this may be the case, for instance, when situational factors temporarily undermine people's ability to engage in deliberate processing (e.g., following a task that is cognitively demanding such as the one we used in Study 1; Hofmann et al., 2012), or for people who are less likely to engage in such deliberate processing in the first place (e.g., those with low trait executive control as observed in Study 2; Miyake & Friedman, 2012).

The current findings have important implications for relationship research. In fact, they corroborate other work showing that the long-term implications of implicit partner evaluations may be due to the fact that they promote constructive relational processes in

the first place (Hicks & McNulty, 2019). Importantly, our results further extend previous research in showing that such influences can affect key maintenance processes at critical times. Because it occurs in highly decisive situations, such as when partners hurt each other, forgiveness is indeed essential to relationship maintenance (McCullough et al., 2000) and personal well-being (Karremans et al., 2003). To date, however, forgiveness remained as a cactus in the relationship realm: a thorny issue. Although forgiveness has long been conceptualized as requiring executive control (Burnette et al., 2014), not everyone is high in trait executive control (Miyake & Friedman, 2012), nor do people always have high executive control across all situations (Hofmann et al., 2012). And yet, forgiveness nevertheless seems to occur in relationship contexts that do not allow people to rely on executive control (Karremans & Aarts, 2007; Stanton & Finkel, 2012) and, until now, research remained mute regarding the source of these impulsive responses. Our work contributes to this gap in showing that, under such conditions, people's forgiving responses are guided by automatic and effortless processes, such as by the spontaneous affective associations that they have toward their partner.

One finding that may seem surprising is that we did not find explicit evaluations to predict forgiveness when executive control is high (see Tables 2 and 4). A possible explanation for this null result may be that, when people engage in deliberative processes, they consider other information than their explicit evaluations to forgive their partner, such as the severity, the domain, the intentionality, or the history of transgressions (Rusbult et al., 1991). Another possibility is that the role of explicit evaluations in determining forgiveness may increase as time goes by (Karremans & Aarts, 2007) and may not be detectable right after, or on the day of, the offense like in our studies. Indeed, given that the link between relationship value and forgiveness seems to be partially mediated by positive cognitive interpretations (Finkel et al., 2002), it might take time for people to form such positive cognitive interpretations and, thus, they may become effective only after some time has elapsed since the incident. Also, it is important to note that explicit evaluations are highly susceptible to motivational biases (e.g., positive illusions; Murray, 1999), which has been found to undermine the predictive power of these evaluations (Faure et al., 2018; McNulty et al., 2013).

Undoubtedly, we do not argue that forgiveness is the only factor that results in relationship success, nor that one should always forgive their partner; indeed, these forgiving behaviors may backfire, such as when constructive behaviors are not reciprocated by the partner (Luchies et al., 2010). In this regard, we believe that automatic processes may nevertheless promote forgiveness when it is particularly adaptive to do so. In fact, it has been hypothesized that implicit partner evaluations have an important functional value, summarizing both one's positive and negative past experiences with a romantic partner such that one can perceive, behave and make appropriate decisions toward that partner (Hicks & McNulty, 2019). Drawing upon this perspective, when executive control is low, implicit partner evaluations may be especially functional and only promote forgiveness toward relationship partners that have been satisfying and reassuring, but not harmful or destructive.

Lastly, it is important to discuss potential boundary conditions and limitations of our work. Notably, our findings stem from young samples of Dutch participants, which might restrict their generalizability to other samples. Also, our interaction effects involved either one or two continuous predictors, and such effects are inevitably more difficult to detect than fully categorical interactions (e.g., 2x2) due to their distributional properties (McClelland & Judd, 1993). Moreover, Study 2 examined how quickly participants forgave their partner, which may be only one component of the forgiving process. Furthermore, this research did not assess the perceived severity of the incidents and, in Study 2, we did not measure the actual reasons for the conflict. Thus, it remains unclear whether implicit partner evaluations promote forgiveness similarly across different domains as well as for both mild and severe transgressions.

Despite these limitations, our work entails several strengths. Following current scientific standards (Finkel et al., 2015; Funder et al., 2014), we used a laboratory experiment to investigate the link between implicit partner evaluations and forgiveness in a controlled environment, we replicated our findings in an ecologically valid daily diary study involving a large sample of romantic couples and controlled for several confounds to increase power, precision, and confidence in the robustness of our effects. Furthermore, while past work has depicted how forgiveness occurs when people have opportunities to engage in cognitive effort, the current investigation instead focuses on a more realistic and prevalent situation: what predicts forgiveness when individuals can hardly engage in such controlled reasoning. Under such circumstances, our findings suggest that their implicit partner evaluations help them foster crucial sentiments to navigate through the storm of inevitable (but forgivable) offenses and, ultimately, to maintain thriving relationships.

Chapter 5

Implicit Ambivalence: A Driving Force to Improve Relationship Problems

This chapter is based on Faure, R., McNulty, J. K., Meltzer, A. L., & Righetti, F. (in press). Implicit ambivalence: A driving force to improve relationship problems. *Social Psychology and Personality Science.*

ABSTRACT

Even the most satisfying partnerships involve conflicts and other frustrating experiences. Although people can explain away negative experiences through effortful motivated reasoning, recent evidence indicates such negativity can nevertheless become associated with the partner in memory. In fact, it appears normative for implicit measures of evaluative associations involving close partners to reveal implicit ambivalence; that is, people hold strong positive *and* negative evaluative associations involving their partner. Despite being common, however, little is known about the consequences of implicit ambivalence. The present longitudinal investigation provides initial evidence that implicit ambivalence can function to motivate relationship improvements. Across two dyadic studies of newlywed couples (N = 448 individuals), multilevel APIM analyses revealed that higher implicit ambivalence was associated with higher motivation to make efforts to improve current marital problems, which predicted reduced marital-problems severity reported by the partner and increased marital satisfaction reported by both spouses several months later.

Keywords: implicit ambivalence, attitudes, motivation to improve, marriage, automatic processes.

Close romantic relationships can be a source of both intense pleasure and intense pain (Gable & Reis, 2001; Gere et al., 2013; Holt-Lunstad et al., 2008). With respect to the former, studies consistently document that romantic relationships offer a variety of rewards, including closeness, support, care, security, shared laugher, and sexual intimacy (Algoe, 2019; Gable & Reis, 2010). Not only are these relational processes associated with increased positive emotions, they contribute to people's fundamental need to belong (Baumeister & Leary, 1995) and positively predict both mental and physical health (Proulx et al., 2007; Robles et al., 2014). Regarding the latter, however, there are inevitably times in which these relationships engender considerable costs. Marriage is a particularly notable example, as increased commitment necessitates that spouses endure conflicts (Braiker & Kelley, 1979), divergence of interests (Righetti et al., 2016), rejections (Murray, Holmes, et al., 2013), and thwarted autonomy needs (Deci & Ryan, 2014). In addition to causing negative affect, these costs can impair both personal and relationship well-being over time (Gable et al., 2003; Holt-Lunstad et al., 2008; Sbarra et al., 2011).

Nevertheless, people are strongly motivated to maintain overly positive views of their partner and their relationship (Murray et al., 1996a; Rusbult et al., 2000). How do people reconcile the inevitable costs engendered by their partner with their ubiquitous desire to see that partner positively? The empirical evidence amassed thus far indicates that people frequently engage in motivated reasoning processes that minimize the extent to which they endorse or even acknowledge that their partner is a stable source of any negative affect (see

Fletcher & Kerr, 2010; Gagné & Lydon, 2004; Murray, 1999). That is, people commonly misremember (e.g., Karney & Frye, 2002), deemphasize (e.g., McNulty & Karney, 2001), and reinterpret (e.g., Murray & Holmes, 1994) negative information about their partner to favor positive interpretations of that partner.

Such negativity does not simply disappear, however. A central tenet of social cognition and attitudinal models is that affectively charged experiences—whether they are positive or negative—become automatically etched in mental representations that are stored in memory as evaluative associations (Baldwin, 1992; Cacioppo & Berntson, 1994; Fazio, 2000, 2007; Gawronski & Bodenhausen, 2006). The sum of these evaluative associations thus defines one's automatic attitudes toward the source of those experiences (Fazio, 2007), and such attitudes are reactivated spontaneously (i.e., without intention, effort, or conscious deliberation) each time one encounters the attitude object (Fazio et al., 1986) to guide subsequent judgments and behaviors toward that target (Fazio, 2000), unless people have sufficient opportunity and motivation to respond otherwise (Fazio, 1990). For this reason, a large body of work indicates that implicit measures are especially suited to capture such automatic attitudes because they specifically restrict opportunities to engage in motivated responding (Fazio & Olson, 2003; Nosek et al., 2011) and can thus detect negativity that is not always acknowledged on more motivationally biased self-reports (Hicks et al., 2020; Hofmann, Gawronski, et al., 2005).

Research on romantic relationships is consistent with these ideas. Not only do implicit measures of automatic attitudes toward partners appear more attuned to people's positive relationship experiences than are self-reported evaluations (Hicks et al., 2016), they also appear to better reflect their more negative relationship experiences (Murray et al., 2010). In a study by Murray and colleagues (2010), for instance, people who reported experiencing more negative partner behaviors across 14 days of a daily diary demonstrated more negative automatic partner attitudes, but not more negative self-reported attitudes, four years later. Such discrepancies appear to emerge because, compared to implicitly measured attitudes, self-reported relationship evaluations are more sensitive to the motivational processes through which people make sense of their romantic realities (Hicks et al., 2018).

Implicit Ambivalence

The fact that implicitly assessed evaluative associations capture both positive and negative experiences makes implicit measures of partner attitudes uniquely positioned to detect attitudinal ambivalence. Consistent with this idea, whereas self-report measures usually, though not always, demonstrate positively biased partner evaluations (Murray, 1999), implicit measures of partner attitudes demonstrate considerable ambivalence on average (i.e., strong positive- *and* negative-partner associations), even in the absence of explicit ambivalence (McNulty et al., 2019; Zayas & Shoda, 2015; see Zayas et al., 2017). For instance, Zayas and Shoda (2015) showed that priming people with the name of their partner (vs. neutral prime) facilitated faster responding to both positive *and* negative words, while participants did not explicitly report negative feelings toward their partner. Likewise,

in McNulty and colleagues (2019), priming people with photos of their spouse versus a neutral stimulus facilitated equally faster responding to both positive *and* negative words, even though participants' self-reported relationship evaluations were overwhelmingly positive.

Although implicit ambivalence appears normative in close relationships, surprisingly little is known about its consequences. A growing body of research indicates that automatic partner attitudes have important implications for relationships (see Hicks & McNulty, 2019). Nevertheless, as far as we are aware, all this work has solely focused on the implications of the overall valence of implicitly assessed evaluative associations involving the partner, either as a relative difference between positive and negative or as separate positive and negative dimensions, leaving it unclear whether having both high positive *and* high negative evaluative associations may impact relationships. How might implicit ambivalence affect romantic couples?

Both theory and empirical work suggest it may motivate improvement efforts. Drawing on early social-psychological theories (e.g., Festinger, 1957; Heider, 1958) positing that people have an important psychological need for cognitive consistency, recent perspectives postulate that inconsistent cognitions or ambivalent feelings are aversive and that the discomfort they cause motivates people to reestablish cognitive and affective consistency (see Gawronski, 2012; van Harreveld et al., 2009, 2015). Consistent with these ideas, several studies indicate that even inconsistencies that do not explicitly cause discomfort (Maio et al., 2001) and that involve evaluations measured implicitly (Petty et al., 2006) can motivate processes aimed at restoring consistency (see Petty et al., 2012). For instance, discrepancies between explicit and implicit evaluations (e.g., negative implicit and positive explicit) have been linked to enhanced processing of relevant information in order to address, and solve, internal doubts (Petty et al., 2006). Critically, such effects emerged even though people were not necessarily *aware* of the inconsistency and did not report feelings of *discomfort*—two aspects otherwise likely to make ambivalence more detrimental for individual and relational well-being (see Holt-Lunstad & Uchino, 2019; van Harreveld et al., 2009, 2015).

Within a close relationship, implicit ambivalence likely reflects a history of both positive and negative experiences with the partner (see Zayas et al., 2017). Resolving this inconsistency thus requires changing the relationship in some way. The ubiquitous motivation to feel positive about the partner (Murray, 1999), coupled with the numerous internal and external constraints that make leaving a close relationship difficult (Bushman & Holt-Lunstad, 2009; Hess, 2000; Rhoades et al., 2010), likely orient this motivation toward improving the relationship in order to better fulfil the fundamental need for connectedness (Baumeister & Leary, 1995; Mikulincer & Shaver, 2007). This may be especially true in marriage, where the barriers to leaving are particularly significant. In fact, some scholars have argued that when commitment is high, such as among married couples, ambivalence may serve as a necessary catalyst for change to improve marital problems and ultimately prevent dissolution (Jonas et al., 2000; Thompson & Holmes, 1996). Given its automatic features, implicit ambivalence might thus be especially functional for marriage by promoting

the motivational processes that are necessary to address relationship issues without eliciting the emotional distress that may too often undermine relational outcomes.

Present Research

The purpose of the current research is to examine the implications of implicit ambivalence in close relationships. Drawing upon work on attitudes and close relationships, we propose that implicit ambivalence may function to foster motivational processes to improve relationship problems. To examine this question, we drew on two longitudinal studies of newlyweds couples to achieve high statistical power and high ecological validity (Curran & Hussong, 2009; Finkel et al., 2015). Newlyweds are a particularly appropriate sample to test our research question given that they have accumulated numerous experiences with one another, are highly committed to one another, and are strongly motivated to see their relationships positively. First, we tested whether greater implicit ambivalence is associated with elevated motivation to make efforts to address existing marital problems in various relationship domains. Second, we tested whether elevated motivation was in fact associated with reduced severity of marital problems and thus associated with improved marital satisfaction among both spouses over time. We provide material and code for this project at: https://osf.io/8tx96/

METHOD

Participants

The present research relied on two studies[25] of North American newlywed couples (total N = 448). Study 1 included 120 couples (including 1 same-sex couple, N = 240, M_{age} = 31.05 SD_{age} = 9.04) and Study 2 included 104 couples (including 5 same-sex couples, N = 208, 52.40% women, M_{age} = 31.23, SD_{age} = 10.56). In both studies, couples were recruited through various approaches (i.e., advertisement on social medias, letters sent to couples who had applied to marriage licenses in the area) within the first 4 months of their wedding and participated in exchange for US$580 and US$505, respectively. Sample sizes were determined a priori based on financial limitations and in accordance with recommendations for couple research to provide adequate statistical power (Finkel et al., 2015). On average, couples had been together for 45.44 months prior to marriage in Study 1 (SD = 31.75), and for 45.97 months in Study 2 (SD = 37.60).

Material and Procedure

Both studies followed similar procedures. Following recruitment, all couple members received packets of questionnaires (either by mail or online) to complete independently at home. This packet included a consent form, instructions, and several self-report

25 Both studies were part of broader longitudinal projects on couples.

measures, including a measure of each participant's (a) perceptions of the severity of the couples' marital problems, (b) motivations to resolve those problems, and (c) marital satisfaction. Next, couples attended a laboratory session where participants completed an implicit measure of partner attitudes and additional tasks beyond the scope of the current research questions. Four months later, participants completed a short follow-up survey that included self-report measures of the severity of their marital problems and marital satisfaction.

Implicit Ambivalence

To assess people's baseline evaluative partner-associations, we used the Partner Evaluative Priming Task (PEPT; see McNulty et al., 2013). The PEPT was modeled after the original version of this task (EPT; Fazio et al., 1995) and has already proven to be suitable for assessing both positive- and negative-partner evaluative associations (Zayas & Shoda, 2015). In this task, participants were showed target words in random order (e.g., charming, disgusting). Their goal was to indicate as rapidly and correctly as possible whether the word displayed on screen was positive or negative. Prior to each target word, a picture prime was briefly shown on screen during 300ms with no delay, which resulted in a stimulus-onset asynchrony (SOA) of 300ms in order to guarantee automatic processing of the prime (Wentura & Degner, 2010). To maximize methodological quality (Scinta & Gable, 2007), picture primes were photos taken during the laboratory session of (a) the participant, (b) their partner, and (c) an attractive opposite-sex alternative, which were randomly displayed in four possible orientations (i.e., front view of the face, profile view of the face, frontal view of the full body while standing, and frontal view of the full body while sitting). In both studies, participants completed three blocks of 48 trials each with an inter-trial delay of 1,000ms. The first block was a practice block, in which no photos were displayed. Instead, all target words were preceded by a neutral prime (i.e., a row of asterisks), which served as a baseline index of participants' reaction time (RT) to positive and negative words. The two remaining test blocks used photos as primes (see Supplemental Material for details and reliability of the task).

To compute implicit ambivalence scores, we followed several steps. First, following standard procedures (Wentura & Degner, 2010), we discarded responses that were either faster than 300ms or slower than 2,000ms, eliminated incorrect responses, and removed participants who made more than 20% errors during the task. Second, we computed two facilitation scores (one for RTs to positive words and one for RTs to negative words) by subtracting aggregate RTs following partner primes from those involving neutral primes. Hence, higher facilitation scores reflect a stronger partner-positive and partner-negative associations relative to baseline orientation to positive and negative words. Third, to ensure that extreme values would not affect the final implicit ambivalence score, we removed facilitation scores that were below or above 3 *SD*s (Wentura & Degner, 2010). Finally, we

applied Griffin's well-established ambivalence formula (Thompson et al., 1995) by using both positive and negative facilitation scores [(Positive + Negative) / 2 - |Positive - Negative|] and, for the above-mentioned reasons, discarded scores above or below 3 *SD*s from the mean. As a result, higher positive scores reflect stronger implicit ambivalence toward one's romantic partner (i.e., both strong positive *and* negative associations), whereas higher negative scores reflect stronger univalent attitudes toward the partner (i.e., either strong positive *or* negative associations) and neutral scores reflect truly neutral attitudes (i.e., neither positive nor negative associations). Additionally, to rule out the possibility that any effect of implicit ambivalence may be driven by more positive or negative partner-associations overall, we calculated traditional relative difference scores for automatic partner attitudes by subtracting negative facilitation scores from positive ones.

Inventory of Marital Problems

At baseline, participants completed a 19-item version of the Marital Problems Inventory (Geiss & O'Leary, 1981) that required participants to indicate (a) the extent to which 19 different relationship areas (e.g., communication, sex) were sources of difficulty in their marriages (Marital Problems Severity; MPS; 1 = *Not a problem*, 11 = *Major problem*; Study 1: α = .88, Study 2: α = .87) and (b) how willing they were to change their own behaviors, preferences, or goals to solve difficulties in each area (Marital Problems Motivation; MPM; 1 = *Not at all willing*, 11 = *Completely willing*; α = .92 and .96, respectively). At follow-up, we assessed participants' MPS using the same inventory (α = .89 and .90, respectively). To calculate MPS and MPM scores, items were averaged such that higher scores reflect more problems severity and greater motivation to repair relationship problems, respectively.

Marital Satisfaction

We assessed participants' self-reported evaluations of their relationship with their partner at baseline and follow-up using three well-established scales (see Supplemental Material). Specifically, participants completed a 15-item semantic differential about their relationship partner (SMD; Osgood et al., 1957), the 6-item Quality of Marriage Index (QMI; Norton, 1983), and the 3-item Kansas Marital Satisfaction (KMS; Schumm et al., 1986). Because these three scales were highly correlated (for both studies, all *r*s ranged from .74 to .85 at baseline and from .69 to .90 at follow-up), we standardized them and created a composite score of explicit marital satisfaction, which showed high consistency in both studies (at baseline, both αs = .92; at follow-up, α = .91 and .96, respectively).

RESULTS

Analysis Strategy

Given the samples, designs, and measures were comparable across studies, we combined both studies into one dataset to conduct an integrative data analysis[26] (Curran & Hussong, 2009) to maximize statistical power and precision (Cumming, 2012). To do so, we pooled the raw data together, computed individual scores as described above, and excluded scores above or below 3 *SDs* from the mean. We also included a study variable[27] (coded -0.5 and 0.5) to control for idiosyncratic differences between studies. To account for the fact that participants were nested within couples, we estimated two-level models with random intercepts and fixed slopes, and treated dyads as indistinguishable given that gender did not moderate our effects (Kenny et al., 2006). To capitalize on the unique features provided by our dyadic sample, we modeled actor and partner effects separately using the Actor-Partner Interdependent Model (APIM; Kenny et al., 2006). All variables were standardized around the grand-mean to provide standardized betas as effect-size estimates. Descriptive statistics and partial correlations are presented in Table 1.

Table 1. Means, Standard Deviations, and Partial Correlations for Baseline Actor Variables

Variables	*M*	*SD*	(2)	(3)	(4)	(5)
(1) Implicit Ambivalence	3.50	109.94	-.14**	.14**	-.05	.01
(2) Automatic Partner Attitudes	-9.25	103.98	--	-.07	-.02	.01
(3) Marital Problems Motivation	9.82	1.28		--	-.27***	.28***
(4) Marital Problems Severity	2.64	1.12			--	-.60***
(5) Marital Satisfaction	0.15	0.64				--

Note. Both MPM and MPS scales from the Inventory of Marital Problems ranged from 1 to 11. Scores from the implicit measure (i.e., implicit ambivalence and automatic partner attitudes) are RTs in ms. Marital satisfaction scores were calculated by averaging *Z*-standardized SMD (M = 96.62, SD = 7.69; scale ranging from 15 to 105), QMI (M = 42.53, SD = 2.89; scale ranging from 6 to 45), and KMS (M = 19.52, SD = 1.61; scale ranging from 3 to 21) scores together. Partial correlations are reported for main actor variables assessed at baseline controlling for study.
*p < .05. **p < .01. ***p < .001.

Primary Analyses

To test our first hypothesis, we regressed actors' motivation scores onto actors' and partners' implicit ambivalence, controlling for study. Consistent with predictions, results revealed a significant actor effect of implicit ambivalence; β = 0.14, SE = 0.05, $CI_{95\%}$ = [0.04, 0.23], p = .006 (see Model 1 in Table 2). That is, after controlling for their partners'

26 Compared to other cumulative approaches (e.g., meta-analyses), integrative data analyses focus on unit-level generated data rather than on study-level aggregated data, which provides greater statistical power and precision to detect even small effect sizes, greater confidence in the reliability and replicability of such effects, as well as unique ways to examine theoretical and methodological questions.

27 Auxiliary analyses indicated that study did not moderate our effects.

implicit ambivalence, participants' implicit ambivalence was positively associated with their motivation to make efforts to solve marital problems.[28]

Table 2. Multilevel Models Predicting Actor's Motivation to Change Marital Problems

	β	*SE*	*df*	*t*	*p*	CI95%
Model 1						
Intercept	0.00	0.05	182.92	0.07	.945	[-0.09, 0.10]
Study	-0.79	0.10	182.41	-7.97	< .001	[-0.98, -0.59]
Implicit Ambivalence (P)	0.04	0.05	363.13	0.80	.425	[-0.06, 0.14]
Implicit Ambivalence (A)	**0.14**	**0.05**	**363.08**	**2.76**	**.006**	**[0.04, 0.23]**
Model 2						
Intercept	-0.02	0.05	161.08	-0.45	.657	[-0.12, 0.07]
Study	-0.87	0.10	160.83	-8.83	< .001	[-1.06, -0.68]
Gender	0.11	0.09	169.20	1.20	.233	[-0.07, 0.29]
Automatic Partner Attitudes (P)	-0.02	0.05	321.87	-0.49	.622	[-0.12, 0.07]
Automatic Partner Attitudes (A)	-0.08	0.05	322.02	-1.69	.093	[-0.18, 0.01]
Marital Problems Severity (P)	-0.05	0.07	318.19	-0.81	.421	[-0.18, 0.07]
Marital Problems Severity (A)	-0.21	0.07	318.11	-3.29	.001	[-0.34, -0.09]
Marital Satisfaction (P)	-0.11	0.06	316.95	-1.78	.076	[-0.23, 0.01]
Marital Satisfaction (A)	0.14	0.06	316.55	2.33	.020	[0.02, 0.26]
Implicit Ambivalence (P)	-0.01	0.05	322.66	-0.18	.859	[-0.11, 0.09]
Implicit Ambivalence (A)	**0.12**	**0.05**	**322.67**	**2.25**	**.025**	**[0.02, 0.22]**

Note. Gender was effects coded (male = -0.5; female = 0.5). A = Actor variables, P = Partner variables.

To examine the robustness of this effect, we estimated another multilevel model that included several covariates. We included traditional scores of automatic partner attitudes to ensure that our results were due to strong bi-valent partner associations (both positive and negative) and not uni-valent partner associations (either positive or negative). Similarly, because people may be more strongly motivated to make changes for mild problems or when they feel more satisfied with their relationship, we controlled for marital-problems severity and marital satisfaction. Finally, we also controlled for gender to ensure our effect did not reflect broader gender differences. As seen in Table 2 (Model 2), none of these constructs accounted for the actor effect of implicit ambivalence, $\beta = 0.12$, $SE = 0.05$, $CI_{95\%} = [0.02, 0.22]$, $p = .025$.

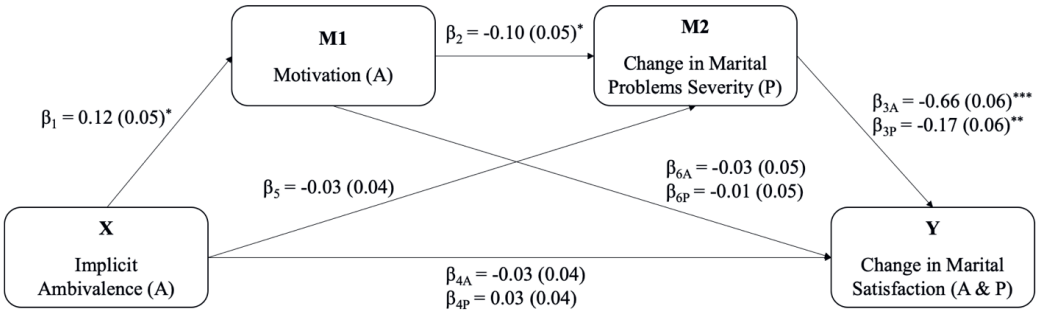
28 Higher implicit ambivalence was also linked to higher motivation in a multilevel model that did not include partners' implicit ambivalence, $\beta = 0.13$, $SE = 0.05$, $CI_{95\%} = [0.04, 0.22]$, $p = .005$.

Mediation Analyses

Given intentions do not always translate into actual change (e.g., Webb & Sheeran, 2006), we investigated whether such motivational processes led to corresponding relationship changes over time—that is, whether motivation was associated with (a) decreases in marital-problems severity and thus (b) increases in marital satisfaction later on. To do so, we performed mediation using the joint-significance method for sequential mediators (A. B. Taylor et al., 2008), to test a three-path mediated effect examining whether stronger implicit ambivalence (X) was associated with higher motivation to make changes (Mediator 1), which in turn predicted lower severity of marital problems over time (Mediator 2), which then led to higher relationship satisfaction (Y). This approach involved testing the significance of each of the three mediation paths (see β_1, β_2, and β_3 in Figure 1), which appears to be the most successful approach to best control for Type I error while warranting good power (A. B. Taylor et al., 2008). We did so by taking a dyadic perspective and examined both the actor's and partner's perception of marital-problem severity and marital satisfaction assessed at Time 2 using the APIM approach. We controlled for baseline scores of these outcome variables at Time 1 to document actual *change* over time.

As previously described (see Table 2), the first path between implicit ambivalence and motivation was significant. For the second path, we performed a multilevel analysis that regressed Time 2 marital-problems severity onto Time 1 marital-problems severity, actors' and partners' Time 1 implicit ambivalence and motivation scores, controlling for study. Results revealed a significant negative association between actors' motivation and changes in their partners' perceived marital-problems severity, $\beta = -0.09$, $SE = 0.04$, $CI_{95\%} = [-0.18, -0.01]$, $p = .030$, indicating that participants' motivation to make effort to address marital issues, which stemmed in part from their own implicit ambivalence, predicted a significant decrease in their partner's perception of marital-problems severity four months later. Interestingly, the negative association between actors' motivation and changes in their own perceptions of marital-problems severity over time did not reach significance, $\beta = -0.05$, $SE = 0.05$, $CI_{95\%} = [-0.14, 0.04]$, $p = .254$. As shown in Table 3, these findings were highly similar when controlling for other actors' and partners' variables.

Figure 1. Three-Path Mediation Model for Sequential Mediation Analysis



Note. Path diagram of the three-path mediation model for sequential mediation analysis involving Actor's Implicit Ambivalence (X), Actor's Motivation (Mediator 1), Partner's Change in Marital Problems Severity (Mediator 2), and both Actor's and Partner's Change in Marital Satisfaction (Y). All reported values are standardized estimates with their standard errors in parentheses. All values for mediation paths predicting outcomes at Time 2 are drawn from analyses that control for such outcomes at Time 1 (hence, predicting change from Time 1 to Time 2). A = Actor variables/effects, P = Partner variables/effects.
$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Table 3. Multilevel Models Predicting Change in Actor's Marital Problems Severity Over Time

	β	*SE*	*df*	*t*	*p*	$CI_{95\%}$
Model 1						
Intercept	-0.06	0.05	157.59	-1.26	.208	[-0.15, 0.03]
Study	-0.05	0.11	161.77	-0.51	.611	[-0.26, 0.15]
Marital Problems Severity (A)	0.54	0.04	328.00	13.27	< .001	[0.46, 0.62]
Implicit Ambivalence (A)	-0.04	0.04	292.02	-0.90	.367	[-0.26, 0.15]
Implicit Ambivalence (P)	-0.04	0.04	295.90	-0.85	.398	[-0.12, 0.05]
Marital Problems Motivation (A)	-0.05	0.05	314.31	-1.14	.254	[-0.14, 0.04]
Marital Problems Motivation (P)	**-0.09**	**0.04**	**307.29**	**-2.18**	**.030**	**[-0.18, -0.01]**
Model 2						
Intercept	-0.10	0.05	142.87	-2.18	.031	[-0.19, -0.01]
Study	-0.05	0.11	141.54	-0.48	.630	[-0.20, 0.06]
Gender	-0.07	0.07	146.76	-1.03	.304	[-0.27, 0.16]
Implicit Ambivalence (A)	-0.03	0.04	271.48	-0.76	.448	[-0.12, 0.05]
Implicit Ambivalence (P)	-0.03	0.04	271.33	-0.77	.442	[-0.12, 0.05]
Automatic Partner Attitudes (A)	-0.07	0.04	267.81	-1.58	.116	[-0.15, 0.01]
Automatic Partner Attitudes (P)	-0.04	0.04	268.34	-0.92	.361	[-0.12, 0.04]
Marital Problems Severity (A)	0.46	0.06	290.73	8.32	< .001	[0.36, 0.57]
Marital Problems Severity (P)	-0.05	0.05	290.67	-0.96	.337	[-0.16, 0.05]
Marital Satisfaction (A)	-0.07	0.05	293.12	-1.43	.153	[-0.18, 0.03]
Marital Satisfaction (P)	-0.12	0.05	292.53	-2.37	.018	[-0.22, -0.02]
Marital Problems Motivation (A)	-0.09	0.05	279.16	-1.77	.078	[-0.18, 0.01]
Marital Problems Motivation (P)	**-0.10**	**0.05**	**277.00**	**-2.02**	**.045**	**[-0.19, -0.00]**

Note. Multilevel models predicted actor's marital problems severity at Time 2 controlling for baseline-levels marital problems severity, and hence predicted change in this outcome over time. All variables included in these models were assessed at baseline (i.e., Time 1). Gender was effects coded (male = -0.5; female = 0.5). A = Actor variables, P = Partner variables.

Finally, for the third and last path, we conducted a multilevel time-lagged analysis in which we regressed marital satisfaction at Time 2 onto Time 1 relationship satisfaction, study, as well as actors' and partners' implicit ambivalence, motivation, and reports of problems severity at both time points. Results revealed that, controlling for Time 1 variables, marital satisfaction was negatively associated with both actors' and partners' report of marital-problems severity at Time 2; β = -0.67, *SE* = 0.06, $CI_{95\%}$ = [-0.78, -0.55], $p < .001$, and β = -0.18, *SE* = 0.06, $CI_{95\%}$ = [-0.28, -0.07], $p = .002$. Again, we obtained similar results in a full APIM model including all actor and partner effects (see Table 4). In sum, having stronger implicit ambivalence toward one's partner was associated with greater motivation to make changes in one's behavior to improve marital problems, which in turn was associated with reduced marital-problems severity reported by the partner over time and thus increased marital satisfaction among both spouses.

Table 4. Multilevel Models Predicting Change in Actor's Marital Satisfaction Over Time

	β	*SE*	*df*	*t*	*p*	$CI_{95\%}$
Model 1						
Intercept	-0.05	0.04	156.29	-1.07	.286	[-0.13, 0.04]
Study	-0.13	0.10	150.04	-1.28	.203	[-0.32, 0.07]
Marital Satisfaction (A)	0.37	0.05	294.17	7.34	< .001	[0.26, 0.45]
Implicit Ambivalence (A)	-0.02	0.04	278.18	-0.52	.603	[-0.10, 0.06]
Implicit Ambivalence (P)	0.03	0.04	277.48	0.70	.484	[-0.05, 0.10]
Marital Problems Motivation (A)	-0.03	0.04	283.49	-0.70	.487	[-0.12, 0.06]
Marital Problems Motivation (P)	0.00	0.05	284.56	0.11	.917	[-0.08, 0.09]
Marital Problems Severity (A)	0.19	0.06	297.85	3.21	.001	[0.08, 0.30]
Marital Problems Severity (P)	0.16	0.05	297.15	3.14	.002	[0.06, 0.26]
T2 Marital Problems Severity (A)	**-0.67**	**0.06**	**286.07**	**-11.33**	**< .001**	**[-0.78, -0.55]**
T2 Marital Problems Severity (B)	**-0.18**	**0.05**	**297.49**	**-3.19**	**.002**	**[-0.28, -0.07]**
Model 2						
Intercept	-0.04	0.04	147.52	-0.97	.333	[-0.13, 0.04]
Study	-0.10	0.10	143.03	-0.98	.328	[-0.30, 0.10]
Gender	0.01	0.07	148.71	0.20	.845	[-0.11, 0.14]
Implicit Ambivalence (A)	-0.03	0.04	264.69	-0.71	.477	[-0.11, 0.05]
Implicit Ambivalence (P)	0.03	0.04	265.46	0.68	.500	[-0.05, 0.11]
Automatic Partner Attitudes (A)	0.01	0.04	260.79	0.29	.771	[-0.06, 0.09]
Automatic Partner Attitudes (P)	-0.06	0.04	261.19	-1.48	.141	[-0.14, 0.02]
Marital Problems Severity (A)	0.19	0.06	283.10	3.21	.001	[0.08, 0.31]
Marital Problems Severity (P)	0.19	0.06	282.99	3.23	.001	[0.08, 0.31]
Marital Satisfaction (A)	0.37	0.05	280.69	7.50	< .001	[0.28, 0.47]
Marital Satisfaction (P)	0.08	0.05	280.48	1.67	.097	[-0.01, 0.18]
Marital Problems Motivation (A)	-0.03	0.05	267.61	-0.64	.520	[-0.12, 0.06]
Marital Problems Motivation (P)	-0.01	0.05	268.33	-0.23	.819	[-0.10, 0.08]
T2 Marital Problems Severity (A)	**-0.66**	**0.06**	**283.31**	**-11.08**	**< .001**	**[-0.78, -0.55]**
T2 Marital Problems Severity (P)	**-0.17**	**0.06**	**283.92**	**-3.04**	**.003**	**[-0.28, -0.06]**

Note. Multilevel models predicted actor's marital satisfaction at Time 2 controlling for baseline-levels marital satisfaction, and hence predicted change in this outcome over time. All variables included in these models were assessed at baseline (i.e., Time 1) unless specified otherwise (i.e., T2). Gender was effects coded (male = -0.5; female = 0.5). A = Actor variables, P = Partner variables. T2 = Time 2.

GENERAL DISCUSSION

At times, even the most satisfying marriages disappoint. Although people can sometimes rationalize negative experiences through effortful reasoning, such negativity is automatically learned and stored as evaluative associations that are activated in subsequent encounters with the partner. Indeed, it appears normative for people to develop both strong positive *and* negative evaluative associations toward their partner and thus experience implicit ambivalence (see Zayas et al., 2017). The present work provides the first empirical evidence that implicit ambivalence may be a driving force to improve marriage. Using a large sample of newlywed couples, we found that implicit ambivalence was positively and robustly associated with the motivation to make efforts in an attempt to solve current marital problems, even after controlling for several confounds. In turn, such motivation was associated with reduced severity of marital problems as perceived by the partner four months later which, then, predicted positive changes in marital satisfaction among both spouses.

These findings join others in highlighting the functional value of automatic processes in relationships contexts (Hicks & McNulty, 2019). Whereas previous research focused on the relative difference between positive and negative evaluative associations, the current work extends these perspectives by further considering the affective complexity that characterizes automatic partner attitudes. Specifically, our results show that both positive and negative evaluative associations *in combination* (rather than *in comparison*) can have unique implications in interpersonal contexts and serve critical functions for relationship success.

The fact that it is the ambivalence and not the relative difference in evaluative associations that activates the motivation to make efforts is consistent with both attachment (Mikulincer & Shaver, 2007) and interdependence theories (Kelley & Thibaut, 1978). Indeed, both theoretical accounts suggest such motivational processes should occur specifically for individuals who care but also feel frustrated in their marriage, because (a) those are the ones who have the strongest incentives (i.e., high positive-partner associations) and needs (i.e., high negative-partner associations) to improve their relationship and (b) these efforts may enable people to fulfil their connectedness needs (Mikulincer & Shaver, 2007) and enhance their relationship quality (Kelley & Thibaut, 1978). In contrast, individuals low in either one or both types of partner-associations are less likely to engage in such efforts. People with mostly high positive-partner associations may simply not need change, whereas people with mostly high negative-partner associations may withdraw from a destructive partner (Murray et al., 2012), and people with low positive and negative associations (i.e., implicit indifference) may remain rather passive in their relationship (Holt-Lunstad & Uchino, 2019).

The present work also supports traditional accounts of attitudinal ambivalence (Thompson et al., 1995; van Harreveld et al., 2009, 2015) and cognitive consistency more broadly (Brannon & Gawronski, 2018; Festinger, 1957; Gawronski, 2012; Heider, 1958).

That is, our findings corroborate the notion that having ambivalent feelings, or inconsistent cognitions, can foster motivational processes that aim at resolving such conflict (see Petty et al., 2012). In this way, our results join others in showing that, although initially conceptualized as weak attitudes, ambivalent attitudes can have important consequences for downstream processes, especially in domains that are personally relevant and where commitment is high (Jonas et al., 2000; Thompson & Holmes, 1996; van Harreveld et al., 2015).

That said, these findings also make several novel contributions to this literature. First, they expand these principles to ambivalence occurring between two automatic processes. Indeed, despite the recognition that an attitude-object can be linked to both positive and negative associations in memory (Cacioppo & Berntson, 1994) and that such dualism is not always reflected through self-report (Greenwald et al., 2002), research on ambivalence primarily relies on self-reported evaluations (see van Harreveld et al., 2015). Although some studies have examined the structural properties of implicit ambivalence (e.g., de Liver et al., 2007; McNulty et al., 2019; Mikulincer et al., 2010; Zayas & Shoda, 2015) and the implications of implicit-explicit discrepancies (e.g., Briñol et al., 2006; Petty et al., 2006; Schröder-Abé et al., 2007), to our knowledge, no prior research has investigated the consequences of concurrent positive and negative implicitly assessed evaluative associations. Our findings suggest that even implicit ambivalence stemming from conflicting evaluative associations can trigger behavioral intentions aimed at restoring cognitive consistency, and that such motivational processes might arise before people even realize and explicitly endorse their mixed feelings.

Second, these findings extend insights regarding the role of ambivalence to a novel context—that of ongoing romantic relationships. Indeed, for the most part, previous studies were conducted in artificial settings and examined ambivalence towards attitude-objects that might not be personally meaningful to people (e.g., imaginary targets; Petty et al., 2006), to which they might not be regularly exposed (e.g., minority groups; Pacilli et al., 2013), and that can be easily avoided in daily life (e.g., food; Gillebaart et al., 2016). In contrast, romantic relationships are contexts in which dyads continuously interact with one another despite inevitable ups and downs, and ambivalence is particularly meaningful in such contexts because it stems from an accumulation of emotionally charged experiences (see Faure et al., 2020). Hence, not only do our results show that implicit ambivalence predicts outcomes that are theoretically relevant in real-life settings, but that this may have important practical implications. Indeed, relationship quality is a key factor of survival (Holt-Lunstad et al., 2008; Robles et al., 2014; Sbarra et al., 2011). Thus, the fact that implicit ambivalence in the current study was indirectly associated with a significant *increase* in marital quality over the course of several months for *both spouses* is particularly impressive because, even though small, this association (a) suggests such change was grounded in shared reality rather than in the mere subjective perception of that reality, (b) emerged while spouses continued to encounter real-life experiences, and (c) benefited an outcome that is practically relevant for society.

Before closing, it is important to discuss the boundary conditions of our findings and the limitations of our work. Given our sample of newlyweds, we only focused on implicit ambivalence and not on explicit ambivalence, leaving unclear to what extent the former relates to the latter. Previous work on newlyweds reveals that self-reported evaluations are highly skewed toward overwhelming positivity, even among people who demonstrate normative levels of implicit ambivalence (McNulty et al., 2019); a discrepancy that is consistent with evidence showing weak associations between different measures of relationship evaluations (e.g., implicit vs. self-report; Hicks et al., 2020) and different forms of ambivalence (e.g., objective vs. subjective, implicit vs. explicit; see van Harreveld et al., 2015; Zayas et al., 2017).

With this in mind, directions for future research include examining the conditions under which implicit ambivalence aligns with, or translates into explicit ambivalence. According to prior work on social cognition generally (Gawronski & Brannon, 2019) and attitudinal ambivalence specifically (van Harreveld et al., 2009), this may occur when individuals have more tolerance for conflicting feelings (e.g., dialectical thinkers; Shiota et al., 2010), reduced opportunities to engage in motivated reasoning (e.g., under stress; Hicks et al., 2020), or external threats making their ambivalence salient (e.g., attractive alternatives; Zoppolat et al., 2020). Furthermore, given that explicit forms of ambivalence have been negatively linked to relationship functioning and well-being (see Holt-Lunstad & Uchino, 2019), such research may also identify the factors explaining how and why explicit ambivalence then becomes detrimental for relationships whereas implicit ambivalence instead appears to trigger regulatory relationship processes. For instance, it might be that explicit ambivalence is less functional than implicit ambivalence because the conscious experience of mixed feelings engenders destructive ruminative thoughts (Kachadourian et al., 2005) and motivates people to change their spouse more than themselves (Hira & Overall, 2011).

Conclusions

The present research provides novel evidence that implicit ambivalence—the spontaneous activation of both positive and negative evaluative associations toward one's spouse—may play a key role in improving relationships. That is, implicit ambivalence may represent the hidden force that drives people's efforts to change their own behaviors, preferences, and goals in order to successfully reduce the severity of their relationship problems and, ultimately, improve the quality of the relationship for both partners.

Chapter 6

The Case for Studying Implicit Social Cognition in Close Relationships

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ABSTRACT

This review offers close relationships as a fruitful avenue to address long-lasting questions and current controversies in implicit social cognition research. Close relationships provide a unique opportunity to study strong attitudes that are formed and updated through ongoing contact with significant others and appear to have important downstream consequences. Therefore, close relationship contexts enable researchers to apply fine-grained, dyadic, longitudinal methodologies to provide unique insights regarding whether and how automatic attitudes relate to personal experience, change meaningfully and reliably over time, and predict consequential judgements and behaviors. Further, given that close relationships are critical to people's well-being and health, applying implicit social cognition theories to close relationships may also offer practical benefits regarding real-world issues related to relationship decay. In this regard, we provide guidance for future research by highlighting how continuing to refine our understanding of implicit social cognition in close relationships can inform interventions and reliably benefit society.

Keywords: implicit measures, automatic attitudes, close relationships.

It has been nearly 25 years since the first implicit measures were created, namely the Evaluative Priming Task (EPT; Fazio et al., 1995) and the Implicit Association Test (IAT; Greenwald et al., 1998). Originally, these performance-based measures were designed to help gain a deeper insight in people's automatic attitudes[29] (i.e., implicit evaluations) toward socially desirable topics or motivationally relevant targets; the spontaneous gut-feeling reactions to attitude-objects (e.g., racial groups) that people have but may be unwilling or perhaps even unable to verbalize through direct, explicit, and deliberate self-report. Ever since, research in implicit social cognition has expanded sharply, generating several theoretical accounts and empirical investigations on the dualism between automatic and deliberate attitudes, their underlying processes, and the conditions under which they are more likely to align with one another and to relate to behavior (e.g., Cameron et al., 2012; De Houwer et al., 2009; Fazio, 1990; Fazio & Olson, 2014; Gawronski & Bodenhausen, 2006, 2011; Gawronski & Brannon, 2019; Greenwald et al., 2009; Hofmann, Gawronski, et al., 2005; Oswald et al., 2013).

Despite exponential research on crucial research questions, however, answers to key aspects of implicit social cognition remain unclear. Most notable among these are questions

29 Several terminologies can be found in the literature to refer to spontaneously-activated attitudes (e.g., automatic, implicit, associative, impulsive), each of which is sometimes used in different ways (e.g., to refer to distinct kinds of attitudes, measurements, underlying processes, or evaluative responses; see Gawronski & Brannon, 2019). Here, we use automatic attitudes to describe the observable outcome (i.e., responses) obtained by implicit measures.

regarding the nature of automatic attitudes, their temporal stability, as well as their real-life implications for both individual and societal outcomes (see Payne et al., 2017). Here, we argue that (a) such gaps in our understanding may stem, in part, from several shortcomings of the contexts and methods used to investigate these issues and thus (b) one way to improve upon such limitations is to study strong attitudes in domains that involve ongoing contact with important others. We offer close relationships as one option. Indeed, applying implicit social cognition research to the study of close relationships offers a unique opportunity to examine how automatic attitudes can develop from personal experiences, how they can change in a meaningful and reliable fashion over time, and how they can shape consequential judgments and behaviors with real-life implications. Moreover, the importance of close relationships for personal health (Robles et al., 2014) suggests such a focus may help address critical societal issues in the real world, such as those associated with relationship decay.

AUTOMATIC ATTITUDES IN CLOSE RELATIONSHIPS

Fazio (2007) defined an attitude as a summary of associations in memory between an object and one's evaluation of that object, the valence of which presumably reflects the valence of one's previous affective experiences in relation to that object. Especially when strong, such attitudes become spontaneously activated whenever one encounters or considers the object (see (Fazio et al., 1986) and, once activated, serve as a default guide to attention, construal, and behavior, all without effort (see Fazio, 1990, 2000; Gawronski & Bodenhausen, 2006). With this perspective in mind, we conceptualize automatic attitudes toward a close relationship partner as a summary of the evaluative associations toward that partner, which is formed and developed mostly through personal experiences related to that partner. Our conceptualization thus assumes that automatic partner attitudes, as assessed by implicit measures, reflect people's past, perhaps mostly affective, experiences related to their partner. Given the numerous dyadic experiences occurring in relationships and the powerful links between close relationships and well-being (Proulx et al., 2007), automatic partner attitudes are likely to involve associations that are quite strong and meaningful to people. Accordingly, we argue that these summaries are activated whenever people encounter their partners (i.e., frequently), that these activated evaluative associations have the power to drive attention, construal, judgment, and behavior, and that they are updated as new relationship experiences become associated with the partner. As will be described, this conceptualization has received considerable empirical support (for a review, see Hicks & McNulty, 2019).

What is important to realize is that automatic partner attitudes are not universally positive. Close relationships are characterized by high levels of interdependence (Kelley & Thibaut, 1978), which means partners have considerable mutual influence on one another. As such, relationships are characterized by opportunities for extremely positive emotional

experiences when partners' goals align, but also extremely negative emotional experiences when partners' goals do not align. Consequently, automatic attitudes toward close partners involve both positive and negative associations (McNulty et al., 2019; Zayas & Shoda, 2015; see Zayas et al., 2017), and these negative associations contrast starkly with people's strong motivations to perceive and present their partners and relationships positively (Murray, 1999). Thus, like other domains in which the study of implicit social cognition has proven useful, close relationships offer an opportunity to study how people cope with, successfully and unsuccessfully, unwanted evaluative associations. In the remainder of this article, we outline how studying such attitudes can both invigorate theoretical work on implicit social cognition and suggest practical implications for our society.

PROBING IMPLICIT SOCIAL COGNITION THEORIES AND CONTROVERSIES IN CLOSE RELATIONSHIPS

Over the last 25 years, implicit social cognition research on attitude change and the link between attitudes and behavior has yielded mixed findings (e.g., Ferguson et al., 2019; Forscher et al., 2019; Gregg et al., 2006; Kurdi et al., 2019; Kurdi & Banaji, 2017a, 2019; Lai et al., 2014, 2016; Olson & Fazio, 2006). These inconsistencies have inspired the development of competing theoretical accounts and ongoing debates regarding the very nature of automatic attitudes as assessed by implicit measures (e.g., Forscher et al., 2019; Payne et al., 2017), the factors and processes underlying changes in automatic attitudes (e.g., De Houwer, 2014; Gawronski & Bodenhausen, 2006, 2011; Jones et al., 2010), and whether automatic attitudes can reliably predict meaningful behaviors in the real world (e.g., Fazio & Olson, 2014; Forscher et al., 2019; Payne et al., 2017). In the following sections, we describe how studying automatic attitudes in relationships may offer unique possibilities to address existing controversies as well as to test and extend predictions derived from the most dominant perspectives on the nature, antecedents, and consequences of automatic attitudes.

Nature of Automatic Attitudes: Person-Culture Controversies

As previously noted, automatic attitudes have been conceptualized as the sum of evaluative associations that people form through direct or indirect experience with an attitude-object in order to help them navigating their environment (Fazio, 2000, 2007). Recent investigations, however, have questioned the idea that automatic attitudes represent stable individual-level evaluations, suggesting instead that they may reflect contextual features made temporarily accessible in one's environment (Forscher et al., 2019; Payne et al., 2017). More specifically, these perspectives propose that automatic attitudes might merely reflect global (i.e., cultural) phenomena from our social environment (e.g., racial stereotypes) that are meaningful and reliable at a population level but ephemeral and unreliable at the individual level. These views are consistent with evidence showing that, at the individual

level, implicit bias toward racial minorities fluctuate significantly over time (Gawronski et al., 2017), mostly randomly (Vuletich & Payne, 2019), and without reflecting consistent changes in explicit evaluations or behavioral outcomes (Forscher et al., 2019), whereas, at the population level, implicit bias remains relatively stable over time (Lai et al., 2016), with slow patterns of change that appear to mirror various markers of social disparities (Charlesworth & Banaji, 2019; Payne et al., 2017; Vuletich & Payne, 2019).

An extreme interpretation of this body of work is that implicitly assessed associations merely reflect environmental variance, and that such contextual influences, not the individual attitudes themselves, drive downstream processes. For instance, Forscher and colleagues (2019), suggested that "automatically retrieved associations reflect the residual "scar" of concepts that are frequently paired together within the social environment and do not have much causal force on their own" (p. 42). However, before we question the power of automatic attitudes, and even the value of the construct itself, it is worth considering that there may be considerable variance in the processes captured by implicit measures. Indeed, some implicit measures are more susceptible to extra-personal, cultural information, as compared to personal evaluative information (Olson & Fazio, 2004). Moreover, and perhaps more importantly, much of existing work has focused on automatically retrieved associations involving novel, unknown members of various outgroups (e.g., Blacks), and such targets may be considerably more susceptible to cultural beliefs than are automatically retrieved associations toward a significant and well-known other.

Although there is no doubt that culture likely explains a significant amount of the systematic variance in individuals' stereotypes and automatic attitudes toward various groups, this may be less so for other attitudes in other contexts, like a close relationship. For instance, when participants are shown pictures of unknown members from different ethnic groups, their attitude may indeed be largely rooted in racial stereotypes that are learned via omnipresent media exposure, rather than in past and often trivial interpersonal interactions with (these specific) unfamiliar outgroup members. On the contrary, although stereotypes of what makes an attractive and worthwhile partner likely play some role in partner attitudes (Fletcher et al., 1999), such contextual influences may pale in comparison to the ongoing emotional exchanges that characterize a close relationship. Indeed, in contrast to the bias of crowds model (Payne et al., 2017) predicting that "implicit bias measures should have a high degree of temporal stability, so long as we examine the stability of situations or contexts rather than persons" (p. 243), existing evidence within relationship science suggests that *within-person* scores of automatic partner attitudes assessed with an evaluative priming measure demonstrated significant test-rest reliability for as long as three years (McNulty et al., 2014, 2019). Although this research did not directly examine the extent to which such stability emerged despite considerable instability in the environment, the fact that close relationships can last over a long period of time and face different environmental circumstances offers various ways to do so.

In fact, it may be that variance in the frequency, duration, and impact of one's personal experience with a target individual plays an important and theoretically meaningful role

in determining whether implicitly assessed attitudes toward that target reflect personal versus cultural associations. Over the course of a long-term relationship, people encounter a variety of relationship experiences that are emotionally charged (e.g., humor, sexual intercourse, conflict). Affective rewards and costs that are personally experienced in the relationship likely become associated with the partner and, through the accumulation of such experiences, people may form a rich history of evaluative associations that make partner attitudes more personal, more anchored, and therefore more stable and less susceptible to contextual influences as time goes by. Indeed, existing evidence suggests that automatic partner attitudes do appear to reflect *personal* experiences with the partner (Banse & Kowalick, 2007; Hicks et al., 2016, 2018; Murray et al., 2010; Zayas & Shoda, 2015) rather than *cultural* features that are temporarily available in the environment (we detail some of these findings further in the next section).

This is not to say that cultural and contextual factors play no role in the process by which automatic partner attitudes develop, change, and impact relationships. Different people have different ideals and prototypes of what romantic relationships are like and what romantic partners should be like. Nevertheless, both theoretical (Kelley & Thibaut, 1978) and empirical research (Fletcher et al., 1999; McNulty, 2016) suggest that these ideals should *moderate* any effects of people's experience with their partners on their evaluations of those experiences, including perhaps their automatic partner attitudes, rather than exert direct effects on such attitudes. For instance, between-person (or between-culture) variance in the ideal that conflict is bad for relationships should determine the extent to which conflict with a partner predicts one's evaluation of that partner (see Fletcher et al., 1999).

Further, what is critical to note is that researchers can directly examine any contextual factors—whether they be cultural or relationship-specific—that do influence automatic partner attitudes. Because relationships have their own contexts that can be measured and tracked over time through videotaped problem-solving interactions (Faure et al., 2018), diary studies (Murray et al., 2015), and longitudinal designs (McNulty et al., 2014), researchers can use such methods to directly assess contextual factors (e.g., work, stress, children, cultural beliefs, etc.) and examine the extent to which automatic attitudes change in response to environmental versus relationship experiences. In fact, close relationships offer a unique environmental feature not offered in other domains—both partners share considerable environmental experiences (same household, budget, children, etc.), yet each member of the couple has an individual-level attitude and exhibits individual-level behaviors.

Indeed, recent work examining changes in people's automatic partner attitudes during the transition to parenthood, and all the life changes associated with that experience (Murray et al., 2019), revealed that post-transition automatic partner attitudes are more contextualized, such that people incorporate information about the baby and the new role of their partner as a parent into their attitudes. In other words, consistent with the "bias of the crowds" argument, people's attitudes do reflect environmental changes. But consistent with the fact that such attitudes are meaningful, these aspects of the environment

are critical aspects of people's lives. Indeed, changes in automatic partner attitudes over the transition to parenthood were associated with physiological and behavioral responses to post-transition stressors. The point here is not to argue that implicit prejudice or even relationship attitudes are not highly susceptible to context, or even that these issues cannot be addressed without studying relationships. Instead, the point is that close relationships offer a unique opportunity to address important questions regarding the very nature of implicitly assessed attitudes and to gain a better understanding regarding the individual vs. situational systematic variance in people's automatic attitudes.

Attitude Change

In addition to offering opportunities to clarify their nature, studying how automatic attitudes toward a close partner develop and change over time can also enhance opportunities to examine the stability of implicitly assessed attitudes, how they change over time, and the mechanisms through which any change occurs. These topics have received considerable attention in implicit social cognition research over the last decade (for a review, see Gawronski & Brannon, 2019). At the same time, however, recent investigations have cast doubts on the validity and the durability of attitude change, as well as about the processes underlying change (e.g., De Houwer, 2014; Forscher et al., 2019; Jones et al., 2010; Lai et al., 2016; Payne et al., 2017). For instance, while a recent meta-analysis provided evidence that some interventions were successful in inducing changes in automatic attitudes (Forscher et al., 2019), other work showed that these effects did not carry on beyond laboratory settings—they vanished in the next few hours or days (Lai et al., 2016) after which automatic attitudes started to fluctuate in meaningless ways (Vuletich & Payne, 2019).

We believe that close relationships offer an opportunity to offer clarity regarding these issues. For example, once again, variance in one's familiarity with an attitude object may play an important role in determining how easily one's attitude toward that object changes over time. For the most part, previous works targeted attitudes for which participants have very little history (abstract shapes, fictitious characters, photos of unknown individuals, etc.; e.g., Ferguson et al., 2019; Olson & Fazio, 2001). Given that attitude strength likely influences the flexibility of attitudes (Fazio, 2007), it stands to reason that automatic attitudes toward unfamiliar others should be more malleable and less reliable compared to those toward more familiar others. Likewise, the particular processes involved in such change, whether they be associative (Jones et al., 2010), propositional (De Houwer, 2014), or a combination of both (Kurdi & Banaji, 2019), may also depend on one's familiarity with an object (e.g., Ferguson et al., 2019; Van Dessel et al., 2015). For instance, it may be that weak and ill-formed automatic attitudes are able to integrate new propositional information quickly, whereas change in well-learned automatic attitudes requires a deeper modification of one's past learning through associative processing (Ferguson et al., 2019; Kurdi & Banaji, 2019). The tremendous variance in relationship length offers a unique opportunity to address these possibilities.

Further, close relationships offer a context to study change and the durability of change over considerably long intervals as it naturally occurs in real-life contexts. Longitudinal studies of relationships span anything from one week with diary studies assessing daily fluctuations (McNulty & Karney, 2001) to more than 50 years (Kelly & Conley, 1987), and one study has predicted changes in automatic attitudes toward the same marital spouse over three years (McNulty et al., 2014). Not only could such repeated-measures designs improve issues related to construct validity, statistical power, and measurement error in order to detect reliable effects that are small in size (Finkel et al., 2015; Kurdi & Banaji, 2017b), but they may also document how these changes unfold in everyday life (in terms of speed, trajectory, and underlying processes), and whether any such effects are contextualized according to specific areas in the relationship (e.g., sexual partner versus parenting partner; see Gawronski et al., 2018).

Even when targeting strong attitudes, past research conducted outside close relationships has mainly focused on short-term changes in single laboratory sessions (Ferguson et al., 2019; Forscher et al., 2019; Kurdi & Banaji, 2019; Lai et al., 2014, 2016). There are important exceptions, of course, and we do not mean to imply that such extensive longitudinal work cannot be done outside of the context of close relationships. For instance, a recent investigation by Gawronski and colleagues (2017) demonstrated that automatic attitudes in different domains (i.e., self-concept, racial attitudes, political attitudes) had greater fluctuations than their explicit counterparts over a few months of time. But studying change in implicitly assessed attitudes toward a partner may offer better opportunities to capture some of the critical real-life factors that moderate or even predict such change, including partners' experiences with one another—a crucial yet often missing piece of the puzzle in existing research (Gawronski et al., 2017; Payne et al., 2017; Vuletich & Payne, 2019). In fact, studying both people's attitudes over time offers a wealth of information about the dynamics involved in change from the perspective of *both* partners, which enables researcher to validate self-reports with partner reports, examine interpersonal consequences (e.g., behavior reported by Eugene predicting change in Melody's automatic attitudes), and investigate the mutual interplay between both partners' automatic attitudes toward each other.

Indeed, research on automatic attitudes toward close relationship partners has contributed to the understanding of attitude change in theoretically meaningful ways. One example involves research consistent with the Associative-Propositional Evaluation model (APE; Gawronski & Bodenhausen, 2006, 2011). According to this model, automatic and deliberate attitudes are the outcome of two different underlying processes; associative and propositional, respectively. Specifically, automatic attitudes are assumed to reflect the activation of associations in memory, which are primarily guided by principles of learning by similarity and contiguity. Conversely, deliberate attitudes are determined by the propositional processes that involve deliberate validation (or rejection) of temporarily activated information guided by the principle of cognitive consistency. Consistent with the idea that repeated exposures to negative experiences with one's partner may modify one's

associative network (i.e., creation of partner-negative associations), existing research on relationships indicates that individuals who reported more conflicts with their partner in daily-life showed more negative automatic partner attitudes over time according to an IAT (Murray et al., 2010). Conversely, given that people are often inclined to reject negative information in order to maintain positive views of their relationships (Murray, 1999), such interpersonal experiences did not change their deliberate attitudes toward their relationship. Similarly, among newlywed couples, frequency of sex—an activity that is likely to contribute to partner-positive associations—as reported by either one or *both* relationship partners was positively associated with increased automatic partner attitudes over the course of the relationship according to an EPT (Hicks et al., 2016). As a comparison, the same association involving deliberate attitudes was only significant for people perceiving such information as a valid basis to update their self-reported judgments—those who believed that sex is important for relationship quality (Hicks et al., 2018).

Importantly, we do not mean to suggest that the data offered support in favor of the APE model over other models. Although the APE model is one of the predominant theories aiming to address attitude change (Gawronski & Brannon, 2019), most of the results that we review here might be reasonably accommodated by other theories—whether they be purely associative (Strack & Deutsch, 2004) or propositional (De Houwer, 2014). Further, given limits in the number of studies, variables, and samples, the evidence remains preliminary and future work should strive to extend the validity of these findings to other relationship stages, dynamics, timespan, and situations. Our critical point here is merely that relationship contexts may prove useful and relevant to address important theoretical issues regarding change in implicitly assessed attitudes.

One potential concern about studying attitudes about close relationship partners may be that researchers must give up some elements of experimental control. And that can be true. But it does not have to be true. In fact, there are opportunities to experimentally manipulate the processes related to change in attitudes and then study attitudes as they progress naturally over time (McNulty et al., 2017; Murray, Pinkus, et al., 2011). In one notable example, McNulty and colleagues (2017) used a sample of 144 married couples to examine whether evaluative conditioning (EC; Hofmann et al., 2010) could enhance automatic partner attitudes and thereby self-reported marital satisfaction. Every three days over six weeks, participants were exposed to pictures of their partner paired either with positive or neutral stimuli. As compared to those in the neutral-pairing condition, people in the positive-pairing condition showed a significant increase in automatic partner attitudes over the course of eight weeks—two weeks longer than the EC sessions lasted. The lasting effects of EC are particularly impressive given that such effects emerged even while couples continued to encounter real-life experiences with one another. Crucially, the EC intervention did not affect automatic self-attitudes, suggesting that these findings are neither due to changes toward other attitude-objects (even those highly connected to the relationship partner, such as the self), nor to changes in other domains that are strongly associated with the self (such as mood). Moreover, the intervention did shape even self-

reported marital satisfaction through its effects on automatic partner attitudes; post-EC automatic partner attitudes positively predicted changes in marital satisfaction over the eight weeks of the study. Taken together, these findings support the idea that close relationships are fruitful contexts to observe meaningful and long-lasting change in automatic attitudes.

Practical Implications for Judgement, Behavior, and Real-World Problems

A final reason for studying implicit social cognition research in close relationships is that doing so offers an opportunity to examine the predictive validity of implicitly assessed attitudes in ways that may have important practical implications for addressing real-world issues in our society, such as the cascade of health impairments that are robustly associated with relationship deterioration (Holt-Lunstad et al., 2008) and relationship dissolution (Sbarra et al., 2011) for both adults and children (Amato, 2000). Recent investigations conducted in intergroup contexts have struggled to find reliable links between implicit measures and individual behaviors, suggesting that implicitly assessed attitudes have no causal power, or that if they do, it is too limited to be meaningful in the real world (e.g., Forscher et al., 2019; Oswald et al., 2013; Payne et al., 2017). It is important to note, however, that an important requirement for attitudes to predict behavior is that such attitudes are strong and relevant in a given context (Fazio, 2007). And yet, existing evidence largely relies on single laboratory studies conducted in artificial settings and involving targets (e.g., photos of strangers) and goals (e.g., deciding whether someone from a different racial group should be selected for a hypothetical job) that may not activate strong inclinations in participants.

Close relationships, in contrast, are contexts that enable researchers to study the link attitude-behavior in more naturalistic and meaningful interactions, but also, and perhaps most importantly, to examine the actual consequences of this link for the functioning and the well-being of real and ongoing relationships that are crucial to people's life. Indeed, there is strong evidence that being socially connected (Holt-Lunstad et al., 2010; House et al., 1988), especially to a romantic partner, is critical to professional success (Finkel et al., 2014), performance (Fitzsimons et al., 2015), well-being (Proulx et al., 2007), health (Kiecolt-Glaser & Newton, 2001) and, ultimately, survival (Robles et al., 2014; Stavrova, 2019). And these associations are stronger than many may realize. For example, not only is social connection one of most reliable factors that protects against suicide (Van Orden et al., 2010), there is meta-analytical evidence that the association between poor relationship quality and mortality is as strong as the effects of better-known risk factors, such as smoking and alcohol use, and even stronger than the effects of other important factors, such as physical activity and body mass index (Holt-Lunstad et al., 2010).

Nevertheless, current evidence also shows that maintaining healthy relationships is notoriously difficult. Divorce rates are increasing in many countries around the world (Amato & James, 2010) and, even when people remain together, romantic satisfaction generally decreases as time goes by (Finkel et al., 2014; Lavner & Bradbury, 2010; McNulty et al., 2013; Meltzer et al., 2014). These trends pose serious societal challenges because

romantic dissolution has severe consequences for children (Amato, 2000) and is highly prejudicial for mental and physical well-being—relationship disruption is a critical predictor of suicide (Kazan et al., 2016) and divorced individuals are 23% more likely to die early than their married counterparts (Sbarra et al., 2011).

In this regard, applying the above-mentioned theoretical perspectives on attitudes to the study of close relationships is both of theoretical interest and practical relevance as it may offer critical insights to our understanding of relationship success and, thus, shed light on ways to mitigate the negative impact of relationship decay. Dual-process theories predict that people's implicitly assessed partner attitudes, most of which, as previously noted, contain at least some negative elements (McNulty et al., 2019; Zayas & Shoda, 2015), will affect behavior when opportunities or motivations to engage in controlled processing are limited (Fazio & Olson, 2014). Crucially, over the course of their relationship, there are many naturally-occurring internal (e.g., intrinsic motivation, type of behavior) and external factors (e.g., household, children, work, or stress; e.g., Buck & Neff, 2012) that can temporarily constrain people's ability to engage in controlled processing, allowing automatic partner attitudes to have substantial real-life implications for downstream processes and relationship maintenance (e.g., Faure et al., 2018; LeBel & Campbell, 2013; Murray et al., 2012, 2015; Murray, Gomillion, et al., 2013; Murray, Pinkus, et al., 2011; Scinta & Gable, 2007).

Consistent with these ideas, existing work has provided evidence that automatic partner attitudes predominantly drive responding when people are less willing or less able to engage in effortful processing—either because of the nature of behavior (e.g., nonverbal communication, Faure et al., 2018), the condition in which it is enacted (e.g., stress, Hicks et al., 2020), or the dispositions pertaining to the actor (e.g., working memory capacity, Murray et al., 2012; self-esteem, Murray et al., 2015; perceived barriers to exit the relationship, Scinta & Gable, 2007). For instance, Hicks and colleagues (2020) demonstrated that, although automatic partner attitudes tended to be unrelated to self-reported relationship satisfaction in a meta-analysis and several direct tests, these attitudes were positively associated with deliberate judgments about the relationship when people were financially incentivized to be accurate about their gut-feelings toward their partner or if their relationship had dissolved (i.e., reduced motivations) or when they experienced higher stress (i.e., reduced opportunities). Likewise, in another demonstration of the role of opportunity in moderating the attitude-behavior association, Faure and colleagues (2018) found that individuals' automatic partner attitudes predicted their nonverbal communication toward their partner as objectively coded by independent raters, rather than their more controllable verbal communication, in problem-solving interactions.

Not only are these effects theoretically relevant, they are also practically meaningful because they illustrate how implicitly assessed attitudes are associated with concrete outcomes in real and meaningful relationships. Indeed, in a sample of newlywed couples, more positive automatic partner attitudes were associated with fewer perceptions of martial problems over the course of 4 years, which in turn predicted less steep declines in

marital quality over that time span whereas self-reported attitudes did not (McNulty et al., 2013). These results suggest that automatic partner attitudes may be key to understanding relationship success versus failure. Indeed, automatic partner attitudes have been found to predict the probability that people will stay or leave their relationship (LeBel & Campbell, 2009; Lee et al., 2010). Further, consistent with the idea that relationships are critical to even personal well-being, McNulty and colleagues (2019) found that having automatic partner attitudes that were one standard deviation more positive than the sample mean was associated with a 50% decrease in suicidal thoughts among married couples in three different samples.

Together, these findings suggest automatic attitudes matter for society–they predict outcomes that are central to human life, such as relationship success (Lee et al., 2010; McNulty et al., 2013) and mental health (McNulty et al., 2019). Questions remain, however, regarding the ideal ways to capitalize on these practical implications. In this regard, theories (Gawronski & Bodenhausen, 2006; Gawronski & Brannon, 2019) and paradigms (Hofmann et al., 2010; Jones et al., 2010) on attitude change derived from implicit social cognition research can benefit relationship science. As noted earlier, repeatedly pairing emotionally-charged stimuli in the mere presence of the partner through evaluative conditioning subsequently improved automatic attitudes toward that partner (McNulty et al., 2017; Murray, Pinkus, et al., 2011). And, crucially, these stable positive changes in automatic partner attitudes in turn improved self-reported marital quality and reduced self-reported suicidal thoughts eight weeks later (McNulty et al., 2017, 2019). These last results thus provide encouraging evidence that interventions targeting at implicitly assessed partner attitudes may not only benefit both relational and individual well-being in the field, but also directly contribute to current societal issues by helping preventing relationship decay and mitigating its negative impact on mental health.

The fact that these effects originated from evaluative conditioning offers some evidence that automatic attitudes can exert real influences—an important step in providing confidence that they do more than merely reflecting the environment. Although there is clearly more work to do in this regard, we believe studying attitudes toward close relationship partners is a valuable domain in which to do it. In addition, given the practical implications of these findings for real-world problems, future research should seek new ways to boost people's automatic attitudes toward socially relevant targets and domains. Indeed, given their automaticity features, automatic attitudes likely influence outcomes repeatedly, over time, and simultaneously, across people, and may therefore have large real-life influences in our society (Greenwald et al., 2015). Of course, this is not to suggest that one should always attempt to change automatic partner attitudes. However, we believe such interventions may be beneficial in specific contexts, such as to supplement couple therapies, to help couples experiencing a rough patch, to accompany people having a long-distance relationship that reduces opportunities to share rewarding experiences with one's partner, or to facilitate critical life transitions in which couple dynamics may change dramatically (e.g., transition to parenthood).

CONCLUDING REMARKS

In light of the theoretical accounts and empirical evidence reviewed here, the current article discusses the multiple benefits of integrating implicit social cognition and relationship science. Close relationships offer unique contexts to apply fined-grained longitudinal investigations that are critical to—yet still sorely missing from—research testing the most dominant theories and addressing current controversies in the field of implicit social cognition.

Indeed, investigating social cognitive processes in close relationships gives researchers an ecologically valid way to examine how important automatic attitudes can relate to personal experience (vs. cultural influence), change meaningfully and reliably over time, and predict crucial behaviors in contexts that can be highly consequential. Importantly, because relationships are critical to people's health as well as the health of their partners and children, applying implicit social cognition theories to the study of close relationships may entail substantial practical implications for solving real-world problems. Notably, this may shed light on ways to mitigate the negative impact of relationship decay by further contributing to our understanding of relationship success and to the development of interventions that can boost marital quality.

Chapter 7

General Discussion

The maintenance of satisfying relationships with a long-term romantic partner is critical to psychological and physiological well-being (Proulx et al., 2007; Robles et al., 2014). However, maintaining well-functioning partnerships is a burdensome adventure (Amato & James, 2010; Finkel et al., 2014). While a long tradition of research has sought to detect early signs of relationship deterioration with the use of explicit evaluations and deliberate processes, in recent years relationship science has seen a remarkable blossoming of research focusing on the importance of automatic evaluative processes in intimate contexts (see Hicks & McNulty, 2019). Inspired from socio-cognitive theories and tools, this growing line of work indicates that implicit partner evaluations—the spontaneous evaluative associations or gut-feeling reaction toward one's partner—have unique long-term implications for relationship quality and stability.

The present dissertation contributes in multiple ways to further understand the role of implicit partner evaluations for the maintenance of well-functioning and satisfying relationships. Integrating research in relationship science and implicit social cognition, the chapters contained in this dissertation address three core issues pertaining to the study of implicit partner evaluations; namely, how they fluctuate and update over time, how they affect daily maintenance processes, and how such focus can invigorate basic implicit social cognition research on attitudes. In the following, I provide a brief summary of the key findings of each empirical chapter, then discuss their implications for relationship science and implicit social cognition, consider the strengths and limitations of this research, and finally offer avenues for future work.

OVERVIEW OF THE EMPIRICAL FINDINGS

Across two studies, Chapter 2 combined observational and field data to examine how implicit vs. explicit partner evaluations fluctuate and update in relationship contexts. Consistent with dual-process theories of attitude change (Gawronski & Bodenhausen, 2006), as compared to explicit, implicit partner evaluations showed greater temporal stability over the course of two weeks. They showed little day-to-day fluctuations and were also weakly associated, if ever, with relationship experiences encountered either in a problem-solving conversation or in on a daily basis. On the contrary, explicit partner evaluations were more reliably associated with such relationship experiences. Over-time analyses, however, revealed that implicit partner evaluations were more strongly tied to the accumulation of experiences across multiple prior days, while this was not the case for explicit, and to highly diagnostic information (e.g., break-up). Altogether, these findings indicate that implicit partner evaluations appear more stable and more sensitive to aggregated rather than discrete experiences, which may ultimately explain why they may outperform their explicit counterpart in predicting later relationship outcomes.

While Chapter 2 focused on their antecedents, the remaining empirical chapters investigated the consequences of implicit partner evaluations for relationship functioning. In Chapter 3, we studied the type of behavior that implicit partner evaluations affect in dyadic interactions. To do so, we videotaped and objectively coded verbal and nonverbal behaviors exhibited by romantic couples while trying to solve a divergence of interests. In line with dual-process theories (Fazio, 1990), people with more positive implicit partner evaluations exhibited more constructive nonverbal (but not verbal) behavior toward their partner; in contrast, explicit evaluations did not predict either type of behavior. Constructive nonverbal behavior, in turn, resulted in higher satisfaction with the outcome of the conversation and in elevated relationship satisfaction a week later. This chapter suggests that one reason why implicit partner evaluations predict relationship satisfaction over time is because they affect crucial spontaneous behaviors in dyadic interactions.

Chapter 4 extended these findings by documenting when and for whom implicit partner evaluations predict other behavioral responses that are critical for relationship maintenance, such as the decision to forgive one's partner. In two studies, we found that implicit partner evaluations predicted forgiveness toward the partner under conditions of low executive control (i.e., reduced opportunity to deliberate; Fazio, 1990). That is, more positive implicit partner evaluations predicted more forgiving responses toward the partner when people's state executive control was experimentally impaired (vs. not) in the lab (Study 4.1) and for people with low (vs. high) trait executive control in the field (Study 4.2). These effects were neither accounted by explicit evaluations nor by other confounds, which strengthens the idea that implicit partner evaluations have the power to drive decisive maintenance responses under specific, yet prevalent, conditions.

Finally, Chapter 5 sought to further examine the implications of having ambivalent implicit partner evaluations for relationship outcomes. In line with the attitudinal ambivalence literature (Petty et al., 2012), integrative data analyses performed on two samples of newlyweds couples revealed that implicit ambivalence toward one's partner was positively associated with the motivation to make changes in one's own behaviors, preferences, or goals to solve problems that they currently face in their marriage, even after controlling for the severity of these problems, marital satisfaction, and the net ratio of implicit partner evaluations. Subsequently, motivation to make efforts predicted reduced severity of marital problems reported by partners four months later which, in turn, resulted in elevated marital satisfaction for both spouses. These findings are the first to indicate that ambivalence in positive and negative implicit partner evaluations can serve unique motivational functions to improve marriage.

IMPLICATIONS AND FUTURE DIRECTIONS FOR RELATIONSHIP SCIENCE

This program of research considerably extends in many ways a growing body of work on automatic processes and implicit evaluations in close relationships (for reviews, see Baldwin et al., 2010; Banse & Imhoff, 2013; Hicks & McNulty, 2019; McNulty & Olson, 2015).

How Do Implicit Partner Evaluations Form?

While prior work has suggested that implicit partner evaluations are especially sensitive to pleasant and unpleasant experiences in the relationship (Hicks et al., 2018; Murray et al., 2010), very few studies have examined actual change in these evaluations (McNulty et al., 2017; Murray et al., 2019) and only one has linked such change to pleasant experiences encountered over three years (Hicks et al., 2016). Chapter 2 adds clarity to this issue by revealing that implicit partner evaluations actually show little sensitivity to daily relationship experiences; instead, they remain relatively stable over time and generally update gradually as experiences accumulate over time, unless such experiences are of particular significance (e.g., break-up). This coincides with research on attitude change indicating that, in the case of targets with whom people have a long history of personal experiences (such as a romantic partner), implicit evaluations should change only when new information is sufficiently strong to shift such large history of past learning; that is, when it is repeated (Rydell et al., 2007) or highly diagnostic (Cone & Ferguson, 2015).

In contrast, the fact that explicit partner evaluations were more sensitive to daily experiences is consistent with the notion that even though intimates are typically positively biased, there are times in which they may be able to accurately incorporate their relationship experiences into their explicit evaluations (Gagné & Lydon, 2004). Interestingly, however, Chapter 2 also showed that people may be less able to deliberatively keep track of the accumulation of these experiences (or perhaps more prone to distort them as they aggregate over time) and thus less able to use them to inform their explicit evaluations. The perspective that implicit, relative to explicit, partner evaluations may better reflect the long-term patterns of relationships rewards and costs aligns with longitudinal work linking implicit (but not explicit) partner evaluations to specific relational experiences encountered over a longer time frame (Hicks et al., 2016; Murray et al., 2010). Thus, according to this perspective, it may be that implicit partner evaluations better predict later relationship outcomes especially because they are more stable and better able to register the summary of affective experiences encountered over the course of the relationship.

Undoubtedly, more evidence is needed to examine how far back implicit partner evaluations reflect the accumulation of past experiences and whether they reflect some relationship domains better than others. Future work could address these questions by tracking daily implicit and explicit partner evaluations multiple times over longer periods of time (e.g., 14-day diaries every month for a year) and examine the extent to which

fluctuations in those evaluations mirror discrete vs. aggregated experiences occurring in various areas (e.g., communication, sex, household, parenting) during these stretches. Such research may also benefit from using more objective measures of dyadic interactions than self-report (e.g., sampling ambient sound bites throughout the day using electronically activated recorders; Mehl, 2017) to disentangle whether implicit vs. explicit partner evaluations are more responsive to what *objectively* occurs in the relationships or to what people *subjectively* perceive and disclose about such interactions.

How Do Implicit Partner Evaluations Affect Relationships?

This dissertation also sheds new light on the role of implicit partner evaluations in affecting later relationship quality and stability (LeBel & Campbell, 2009; Lee et al., 2010; McNulty et al., 2013). In line with attitude models (see Fazio, 2000), the present findings provide long-awaited evidence that implicit partner evaluations can drive behaviors that are critical for relationship functioning, such as nonverbal communication (Chapter 3), forgiveness (Chapter 4), and efforts to improve the relationship (Chapter 5). In addition, and consistent with dual-process theories (Fazio, 1990; Friese et al., 2008; Hofmann, Friese, et al., 2008; Perugini et al., 2010), Chapters 3 and 4 further showed that implicit partner evaluations orient the way people respond to their partner when their opportunities to deliberate are reduced—whether this is due to the type of behavior that is enacted (i.e., spontaneous cues), to the situation in which it is enacted (i.e., cognitively taxing), or to the dispositions of the enacting person (i.e., low trait executive control).

Importantly, these findings indicate that implicit partner evaluations have the power to influence a wide array of behaviors that are essential for relationship maintenance, such as supporting the partner's goals and needs (Reis & Clark, 2013), being willing to sacrifice one's own preference over the partner's (Van Lange et al., 1997), or derogating attractive alternatives (McNulty et al., 2018), and that such influences may occur more often than many may realize. In fact, romantic partners typically interact in a spontaneous and routinized fashion (Rusbult & Van Lange, 1996), and the fact that some individuals are more impulsive than others (Miyake & Friedman, 2012) combined with the numerous contextual factors that regularly impede effortful deliberate reasoning (Hofmann et al., 2012) suggest that relationship behavior may frequently emanate from people's gut feelings toward their partner. One important challenge for future research would thus be to pinpoint the specific, ecologically-valid, and fluctuating motivational and opportunity factors that determine when implicit partner evaluations takes over in everyday life. Such work could, for instance, examine whether the association between implicit partner evaluations and relationship behavior is strongest on days where people encounter attractive alternatives (low motivation), or during the transition to parenthood where partners are typically sleep deprived (low opportunity).

What About Implicit Ambivalence?

Inevitably, given that implicit partner evaluations capture the accumulation of both pleasant and unpleasant relationship experiences, implicit partner evaluations are likely to be both positive and negative, that is ambivalent (Zayas et al., 2017). And prior work outside relationship science suggests that implicit ambivalence may be consequential in relationships because it should motivate people to address the source of their mixed feelings, even if such evaluative conflict is not experienced at the explicit level (Petty et al., 2012). Accordingly, Chapter 5 provided the first empirical evidence showing that implicit ambivalence motivates people to make efforts to improve their marriage. Interestingly, people with univalent implicit partner evaluations—either mostly positive or mostly negative—did not report higher motivation to change. This is consistent with the notion that ambivalent attitudes serve unique functions that are qualitatively different from those induced by univalent attitudes (van Harreveld et al., 2015); in fact, such motivational efforts to improve the relationship should emerge specifically for people who *want* and *need* to see change in their relationships —that is, those who *care* (i.e., high positivity) and feel *frustrated* (i.e., high negativity). As described earlier, although these results do not document when exactly implicit ambivalence may trigger the motivation to make efforts, we speculate that this may particularly be the case in situations that favor automatic processing (see Friese et al., 2008).

It is important to note, however, that ambivalence is not universally positive for relationships. In fact, explicit forms of ambivalence are negatively linked to personal and relational well-being (see Holt-Lunstad & Uchino, 2019), and such destructive effects appear to stem directly from the discomfort that people experience when they subjectively endorse their mixed feelings (see van Harreveld et al., 2015). Thus, future work should examine how ambivalence may translate from implicit to explicit (and vice versa). One possible next step may be to experimentally manipulate implicit ambivalence and trace the unfolding process at the explicit level. In this regard, future research may benefit from using evaluative conditioning procedures, which consist of exposing participants to a stream of images where an attitude-object (e.g., partner photos) is repeatedly paired with valenced stimuli (e.g., positive images) in order to induce consistent change in implicit evaluations toward that attitude-object (Hofmann et al., 2010). Research using such paradigm of evaluative conditioning to make implicit partner evaluations more positive (and thereby less ambivalent) would thus be well-positioned to examine whether reduced implicit ambivalence, in turn, may diminish or even prevent explicit ambivalence from occurring later on. In addition, future research should also investigate the conditions under which ambivalence may be detrimental vs. functional for couples. For instance, it might be that implicit ambivalence may be more likely to turn into explicit ambivalence when people need to make a personally relevant decision about their relationship (see van Harreveld et al., 2009), such as when they feel desire toward an attractive alternative (Zoppolat et al., 2020) or when they contemplate reasons to stay or leave the relationship (Joel et al., 2018), and may become particularly destructive as people start ruminating about their mixed feelings over time (Kachadourian et al., 2005).

Broader Considerations and Practical Implications

This line of research aligns with other work on the merits of using implicit measures to better understand how interpersonal relationships operate, from early signs of romantic interests (Eastwick et al., 2011), to sexual desire toward the partner (de Jong et al., 2019), up until the seeds of marital infidelity (McNulty et al., 2018). Of course, the point here is not to say that explicit evaluations and deliberate processes play no role in close relationships, nor that self-report measures are not informative—they are and they have generated a large volume of knowledge over the years (Finkel et al., 2017). But they come with limitations. And the point is that implicit measures can palliate some of these limitations that too often restrict our ability to understand how relationship come to be (Joel et al., 2017) and to predict whether they will either flourish or perish over time (Joel et al., 2020). As a matter of fact, in this dissertation, implicit measures of partner evaluations predicted real-life *behavior*—whether be self-reported, perceived by the partner, or objectively coded by raters—as well as *change* in relationship quality over time, which is particularly important considering the profound practical impact that relationship quality has for well-being and health (Proulx et al., 2007; Robles et al., 2014).

Hence, not only do these findings invite future research to employ integrative and mixed-methods approaches such as those described in the present dissertation to examine why partners behave the way they do, but they also call for interventions specifically targeting at implicit partner evaluations to improve relationship functioning and well-being, and thus contribute to society. In this regard, there may be two possible routes to intervene. One would be to directly manipulate implicit partner evaluations in order to make them more positive and examine whether this, in turn, can lead to more positive relationship behavior. Future work may do so via evaluative conditioning (Hofmann et al., 2010). As described earlier, in evaluative conditioning interventions, participants are repeatedly exposed to a stream of images that pairs pictures of their partner with positive images (vs. neural images), and supporting evidence suggests that such interventions can enhance implicit partner evaluations which, in turn, has been found to increase later marital quality while decreasing suicidal thoughts (McNulty et al., 2017, 2019).

Another route may be to train people to get insight into their implicit partner evaluations such that their otherwise unnoticed influence on behavior can be better regulated. Indeed, implicit measures of partner evaluations seem to tap onto the spontaneous affective reactions that people gradually form over the course of their relationship and that spring up whenever they encounter their partner, but for which they have limited access due to lack of introspection and strong motivations to deliberate (Hicks et al., 2020). As such, training people to introspect about such spontaneous feelings may represent a step forward in helping them to realize their implicit partner evaluations and, thus, to regulate their influence on behavior in a way that is beneficial for relationship functioning. In this regard, mindfulness is a promising intervention tool. In fact, mindfulness interventions for couples take the form of meditation-based training programs in which people learn how to pay conscious and non-judgmental attention to present-moment experiences relative to their

relationship (e.g., bodily states, thoughts and emotions) in order to increase awareness, acceptance, and regulation of such experiences (see Karremans et al., 2017). Though very little work has formally tested whether mindfulness training can increase awareness of one's inner feelings toward their relationship, preliminary evidence indicates that it promotes relationship quality (Kappen et al., 2019), notably because mindful people become more acceptant of their partner's imperfections (Kappen et al., 2018). Thus, future research should examine whether mindfulness interventions can help people recognize their implicit partner evaluations (as reflected, for instance, by a closer alignment between implicit and explicit partner evaluations) and whether this, in turn, results in greater relationship functioning and well-being.

IMPLICATIONS AND FUTURE DIRECTIONS FOR IMPLICIT SOCIAL COGNITION

The present dissertation also makes important contributions beyond relationship science as it informs implicit social cognition research and attitude literatures more broadly. First, the findings described in this dissertation help establishing the generalizability of predictions made by traditional attitudinal models to the study of well-established targets in everyday life situations. Indeed, up until this point, supporting evidence for the APE model (Gawronski & Bodenhausen, 2006) and the MODE model (Fazio, 1990) largely stems from work examining implicit evaluations toward strangers (e.g., fictional characters or strangers used as exemplars of broad social groups) assessed in artificial laboratory settings. Here, we provide ecologically-valid evidence showing that implicit evaluations toward one's romantic partner change (Chapter 2) and affect behaviors (Chapters 3 and 4) in ways that are consistent with such models. For future studies to be conclusive, these results emphasize the necessity to rely on such theoretical models in order to consider when implicit evaluations *should* and *should not* change or predict behavior (Brownstein et al., 2020; Gawronski, 2019; Gawronski & Brannon, 2019).

Second, this dissertation also has implications for research on attitudinal ambivalence. While prior research has largely focused on the consequences of explicit ambivalence (van Harreveld et al., 2015), the few studies that have examined more implicit forms of ambivalence solely focused on discrepancies between explicit and implicit evaluations (Petty et al., 2012). Chapter 5 thus extends this line of research by providing novel evidence that implicit ambivalence arising from the co-activation of positive and negative implicit evaluations may also promote behavioral intentions aiming to solve such evaluative conflict, even before people explicitly realize and endorse their ambivalence. Perhaps most importantly, these findings further indicate that such motivational processes can surface in contexts that are particularly consequential—those of ongoing close relationships—and translate into actual behavioral changes that have the power to improve both the functioning and the well-being of committed relationships.

Finally, as discussed in Chapter 6, this dissertation is well-positioned to contribute to address long-lasting questions and controversies pertaining to the study of implicit measures. While the field of implicit social cognition has been dominated by research on racial bias, implicit measures have been increasingly criticized for their lack of validity, reliability, and predictive power (Forscher et al., 2019; Schimmack, 2019; Vuletich & Payne, 2019). These criticisms have cast considerable doubts about the suitability of implicit measures to assess individual-level outcomes (e.g., personal racial attitudes), which led some researchers to argue that they may better reflect population-level outcomes (e.g., cultural racial stereotypes) and thus only be valid and reliable measures of *situations* and not of *persons* (Payne et al., 2017). What is important to realize, however, is that some of these limitations may not be due to the measurement tool itself, but to the construct under investigation (Kurdi et al., 2020). And the evidence amassed in this program of research supports this view. In close relationship contexts, where attitude-objects involve ongoing contact with significant others, implicitly measured partner evaluations appear to (a) reflect the history of *personal* experiences with the partner (Chapter 2), (b) remain *stable* over time (Chapter 2), and (c) determine real-life *behaviors* that are likely to affect the actual relationship (Chapters 3-5). These findings thus indicate that implicit measures can assess meaningful individual differences in attitudes and further illustrate that relationship contexts may enable researchers to examine persons *within* situations and provide novel insights about the nature, temporal stability, and implications of implicit evaluations in the real world.

STRENGTHS, LIMITATIONS, AND DIRECTIONS FOR FUTURE RESEARCH

Before closing, it is important to discuss both the strengths and the limitations of the present line of research. Notably, the empirical findings described throughout this dissertation stem from theoretically-driven research conducted on large (and often dyadic) samples of dating couples in the Netherlands and marital relationships in North America. Nevertheless, for the most part, these samples consisted of relatively young, happy, heterosexual, and monogamous couples from WEIRD (Western, Educated, Industrialized, Rich, and Democratic; Henrich et al., 2010) societies. Though the automaticity of our effects may suggest they generalize across cultures and relationships, the extent to which they do remain an empirical question to be addressed.

Readers should also note that most of the present findings are correlational and invite caution when drawing causal conclusions. That being said, it is worth considering that several aspects of this research go beyond standard, cross-sectional designs, and can therefore assuage some of these concerns. In Chapter 2, for instance, our use of pre- and post-conversation assessments combined with daily person-centered assessments enabled us to study *momentary changes* and *within-person fluctuations* in implicit partner evaluations

over time which, though not experimental, of course, may nevertheless suggest (cautious) directional interpretations. Further, Chapter 4 employed an experimental manipulation and controlled for several confounds to demonstrate the causal role of implicit partner evaluations for behavior, which Chapters 3 and 5 supplemented with longitudinal designs to document consistent *changes* in relational outcomes.

Another important aspect of this research is that we observed consistent patterns of results while using different implicit measures (i.e., SC-IAT, AMP, EPT), which helps establishing the generalizability of our findings across measurement tools. The fact that we did not compare these measures to one another, however, leaves questions about potential differences among them and about the best way to assess implicit partner evaluations. Future research should address these issues because work outside relationship science suggests these measures sometimes operate differently (Fazio & Olson, 2003). Relatedly, future research may also benefit from maximizing the structural and conceptual correspondence between implicit and explicit measures of partner evaluations. Indeed, these two measures—including those used in this dissertation—typically differ in many ways, such as in their content (e.g., responses to partner photos vs. responses to statements about the partner's behavior), dimensionality (e.g., affective valence vs. cognitive attributes), and context (e.g., general evaluations vs. evaluations contextualized to specific domains or periods of time). To the extent that such methodological discrepancies may account for some of the observed differences in implicit and explicit evaluations, improving the correspondence between implicit and explicit measures may help interpreting their dissociations in terms of *evaluations* and not in terms of *measurements* (Gawronski, 2019; Payne et al., 2008).

Finally, further work is needed to delve into two issues not addressed by the present research. One pertains to whether or not people are aware of their implicit partner evaluations, which is a hot topic in implicit social cognition research (see Gawronski, 2019). As described earlier, though unclear, the fact that implicit partner evaluations relate to judgment and behavior when opportunity to deliberate is reduced suggests that people may become aware of such evaluations, but that access to them is often obscured by motivations to deliberate (Hicks et al., 2020). The other and perhaps equally debated issue regard the underlying process(es) of implicit partner evaluations (see Corneille & Mertens, 2020). For instance, it remains unclear whether changes in implicit partner evaluations observed in Chapter 2 were underpinned by purely associative (i.e., creation of new associations between co-occurring stimuli; Strack & Deutsch, 2004), purely propositional (i.e., creation of new propositions about the relation between co-occurring stimuli; De Houwer, 2014), or by a combination of both processes (see Gawronski & Bodenhausen, 2006). Likewise, although results from Chapters 3 and 4 are consistent with dual-process theories (Fazio, 1990), they may also very well be accommodated by single-process theories (e.g., Berkman et al., 2017) positing that behavior should arise from one's impulsive gut feelings when one cannot integrate more abstract beliefs and goals into their decision-making process.

CLOSING REMARKS

Given the serious psychological and health-related challenges that relationship deterioration poses to society, understanding how close relationships operate is both of theoretical interest and practical relevance. To this end, relationship researchers have started to recognize and examine the role of automatic evaluative processes in predicting long-term relationship outcomes. Across four empirical chapters, and using a combination of fined-grained longitudinal, experimental, and observational methods, the present dissertation adopts an integrative approach to offer novel insights into how implicit partner evaluations form and affect close relationships in everyday life.

Our findings show that, compared to explicit partner evaluations, implicit partner evaluations remain more stable over time and are more strongly linked to aggregated rather than discrete relationship experiences. This suggests that implicit partner evaluations may generally be more resistant to abrupt changes and update gradually as relationship experiences accumulate over time. Furthermore, we also have learned that implicit partner evaluations have important implications for relationship maintenance because, under specific yet prevalent conditions, they determine behaviors that are critical for long-term relationship well-being above and beyond explicit evaluations, such as nonverbal communication in a problem-solving conversation, forgiveness toward the partner's offense, and behavioral efforts to improve marital problems.

Taken together, these findings provide evidence that implicit partner evaluations play a key role in promoting well-functioning and satisfying relationships. The present dissertation thus highlights the scientific and practical value of integrating research in relationship science and implicit social cognition. In fact, studying implicit partner evaluations in close relationships can help us understand and predict how relationships operate, and identify new ways to intervene on such evaluations to improve relationship well-being. Further, it offers a unique opportunity to invigorate basic implicit social cognition research by examining how strong attitudes are formed through ongoing real-life contact with a significant other and how they affect consequential behaviors in the real world. While relationship research has only started to study automatic processes, with this dissertation I hope to have contributed to this growing field, to have shown the critical role of implicit partner evaluations in relational contexts, and to have paved the way for further integration between relationship science and implicit social cognition research.

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Supplemental Material

SUPPLEMENTAL MATERIAL FOR CHAPTER 2

STUDY 1

1. List of Previous Publications

The ten following publications referred to the same dataset presented in the current work. However, those articles addressed different research questions that are not central to the hypotheses tested in present investigation and, thus, will not be discussed further.

Faure, R., Righetti, F., Seibel, M., & Hofmann, W. (2018). Speech is silver, nonverbal behavior is gold: How implicit partner evaluations affect dyadic interactions in close relationships. *Psychological Science, 29*(11), 1731–1741. https://doi.org/10.1177/0956797618785899

Righetti, F., Balliet, D., Visserman, M., & Hofmann, W. (2015). Trust and the suppression of emotions during sacrifice in close relationships. *Social Cognition*, *33*(5), 505–519. https://doi.org/10.1521/soco.2015.33.5.505

Righetti, F., Gere, J., Hofmann, W., Visserman, M. L., & Van Lange, P. A. M. (2016). The burden of empathy: Partners' responses to divergence of interests in daily life. *Emotion*. https://doi.org/10.1037/emo0000163

Righetti, F., Luchies, L. B., van Gils, S., Slotter, E. B., Witcher, B., & Kumashiro, M. (2015). The prosocial versus proself power holder: How power influences sacrifice in romantic relationships. *Personality and Social Psychology Bulletin*, *41*(6), 779–790. https://doi.org/10.1177/0146167215579054

Righetti, F., Schneider, I., Ferrier, D., Spiridonova, T., Xiang, R., & Impett, E. A. (2020). The bittersweet taste of sacrifice: Consequences for ambivalence and mixed reactions. *Journal of Experimental Psychology: General*. Advance online publication. http://dx.doi.org/10.1037/xge0000750

Righetti, F., & Visserman, M. (2017). I gave too much: Low self-esteem and the regret of sacrifices. *Social Psychological and Personality Science, 9*(4), 453-460. DOI: 10.1177/1948550617707019.

Visserman, M. L., Impett, E. A., Righetti, F., Muise, A., Keltner, D., & Van Lange, P. A. M. (2019). To "see" is to feel grateful? A quasi-signal detection analysis of romantic partners' sacrifices. *Social Psychological and Personality Science*, *10*(3), 317–325. https://doi.org/10.1177/1948550618757599

Visserman, M. L., Righetti, F., Impett, E. A., Keltner, D., & Van Lange, P. A. M. (2017). It's the motive that counts: Perceived sacrifice motives and gratitude in romantic relationships. *Emotion*. https://doi.org/10.1037/emo0000344

Visserman, M. L., Righetti, F., Kumashiro, M., & Van Lange, P. A. M. (2017). Me or us? Self-control promotes a healthy balance between personal and relationship concerns. *Social Psychological and Personality Science*, *8*(1), 55–65. https://doi.org/10.1177/1948550616662121

Zoppolat, G., Visserman, M. L., & Righetti, F. (2020). A nice surprise: Sacrifice expectations and partner appreciation in romantic relationships. *Journal of Social and Personal Relationships*, *37*(2), 450-466. https://doi.org/10.1177/0265407519867145

2. Sample

Data used in Study 1 were drawn from a larger project. In line with current recommendations (Finkel et al., 2015), this sample size was defined before data collection, based on our financial and recruitment constraints, and combined with a diary design to provide adequate statistical power. Criteria to participate in the present study were (a) to speak Dutch fluently, (b) to be committed to a romantic partner for at least 4 months, and (c) to be childless. Participants received an 80€ compensation for completing all study parts. At the end of the study, they were also added to a raffle to win a 200€ bonus.

3. Single Category Implicit Association Test (SC-IAT)

In Study 1, implicit partner evaluations were assessed using a Single Category Implicit Association Test (SC-IAT; Karpinski & Steinman, 2006). The script was retrieved and adjusted from the Millisecond library (https://www.millisecond.com/download/library/iat/sc_iat/) and run on a desk computer with Inquisit 4 Lab (Millisecond, 2015). We describe the organization of the SC-IAT and the stimuli used for this task in Tables S1 and S2, respectively.

Table S1. SC-IAT Organization

Block	Trials	Function	Left-key response	Right-key response
1_a	24	Practice	Positive words + Partner words	Negative words
2_a	72	Test	Positive words + Partner words	Negative words
3_b	24	Practice	Positive words	Negative words + Partner words
4_b	72	Test	Positive words	Negative words + Partner words

Note. Blocks with a common subscript were experienced as one continuous block.

Table S2. *Target Words Used in the SC-IAT*

Original English target words		Dutch translation	
Positive	**Negative**	**Positief**	**Negatief**
Beautiful	Angry	Mooi	Boos
Celebrating	Brutal	Vieren	Wreed
Cheerful	Destroy	Blijdschap	Vernietigen
Excellent	Dirty	Uitstekend	Vies
Excitement	Disaster	Opwinding	Ramp
Fabulous	Disgusting	Fantastisch	Walgelijk
Friendly	Dislike	Vriendelijk	Afkeer
Glad	Evil	Verheugd	Kwaadaardig
Glee [a]	Gross	Gelukkig	Onbeschoft
Happy	Horrible	Blij	Verschrikkelijk [c]
Laughing	Humiliate	Lachen	Vernederen
Likeable	Nasty	Aardig	Smerig [c]
Loving	Noxious	Lief	Schadelijk
Marvelous	Painful	Wonderbaarlijk	Pijnlijk
Pleasure	Revolting	Plezier	Weerzinwekkend
Smiling	Sickening [b]	Glimlachen	Smerig [c]
Splendid	Terrible	Schitterend	Verschrikkelijk [c]
Superb	Tragic	Geweldig	Tragisch
Paradise	Ugly	Paradijs	Lelijk
Triumph	Unpleasant	Overwinning	Onaangenaam
Wonderful	Yucky	Prachtig	Bah

Note. Dutch-translated target words by category (attribute words were the partner's first name, last name, and nickname). A few translations have been adjusted to match the Dutch language. SC-IAT = Single Category Implicit Association Test.
[a] Translation closer to "Lucky". [b] Translation closer to "Filthy". [c] Translations repeated twice due to overlap in meanings.

4. Conversation

During the laboratory session, couples were asked to discuss a current divergence of interests between them while being videotaped. A topic of divergence of interests was defined as one in which both partners had different preferences. They were instructed to discuss this divergence of interests for 7 min as they would normally do at home and in an attempt to find a solution.

4.1. Pre-Conversation Measures

Explicit relationship evaluations

- Right now, I feel satisfied with our relationship (1 = *not at all*; 7 = *extremely*)
- Op dit moment, Ik voel me tevreden met onze relatie (1 = *helemaal niet*; 7 = *extreem*)

4.2. Post-Conversation Measures

We administrated post-conversation measures in two different ways. First, participants watched their own 7–min videotaped interaction and indicated how much they felt understood and supported by their partner for each 30-sec segment of the video. These 14 ratings were then averaged to obtain mean scores for each of these two relationship experiences. Second, participants indicated they general impression of the conversation overall. That is, how much they perceived the conversation as a fight, and how much they perceived their partner as supportive and responsive during the conversation.

Feeling understood (averaged)

- How much did you feel understood by your partner? (1 = *not at all*; 7 = *very much*)
- Hoe zeer voelde jij je begrepen door je partner? (1 = *helemaal niet*; 7 = *heel erg*)

Feeling supported (averaged)

- How much did you feel supported by your partner? (1 = *not at all*; 7 = *very much*)
- Hoe zeer voelde jij je gesteund door je partner? (1 = *helemaal niet*; 7 = *heel erg*)

Perceiving support from partner (overall)

- During the conversation… My partner supported me (1 = *not at all*; 7 = *very much*)
- Tijdens het gesprek… Mijn partner steunde mi (1 = *helemaal niet*; 7 = *heel erg*)

Perceiving responsiveness (overall; 3 items; $\alpha = .80$)

1. During the conversation… My partner understood me (1 = *not at all*; 7 = *very much*)
2. During the conversation… My partner cared about me (1 = *not at all*; 7 = *very much*)
3. During the conversation… My partner appreciated who I really am (1 = *not at all*; 7 = *very much*)

1. Tijdens het gesprek…Mijn partner begreep me (1 = *helemaal niet*; 7 = *heel erg*)
2. Tijdens het gesprek…Mijn partner gaf om me (1 = *helemaal niet*; 7 = *heel erg*)
3. Tijdens het gesprek…Mijn partner waardeerde wie ik werkelijk ben (1 = *helemaal niet*; 7 = *heel erg*)

Perceived conflict (overall)

- The conversation was more like a fight than a peaceful discussion (1 = *not at all*; 7 = *very much*)
- Het gesprek was meer als een ruzie dan een vredige discussie (1 = *helemaal niet*; 7 = *heel erg*)

Explicit relationship evaluations

- Right now, I feel satisfied with our relationship (1 = *not at all*; 7 = *extremely*)
- Op dit moment, Ik voel me tevreden met onze relatie (1 = *helemaal niet*; 7 = *extreem*)

5. Behavioral Codes

In this study, we videotaped the conversation of each romantic couple and trained raters coded the positivity and negativity of both verbal and nonverbal behaviors according to a fine-grained coding system (see Faure et al., 2018). To rule out the possibility that stronger associations between EPEs (vs. IPEs) and relationship experiences may be due to the fact that, as opposed to IPEs, both EPEs and relationship experiences were assessed through self-report, we examined whether revisions in EPEs and IPEs were associated with verbal and nonverbal behaviors exhibited in the interaction as objectively coded by independent raters.

To do so, we ran two similar multilevel models that regressed participants' post-conversation implicit (or explicit) evaluations onto their pre-conversation implicit (or explicit) evaluations as well as onto an objective assessment of the constructive nature of their verbal and nonverbal behaviors exhibited by their partner (as reflected by a difference score between the positivity and the negativity expressed within verbal and nonverbal cues). As shown in Table S3, there was a significant association between a person's change in explicit evaluations and their partner's nonverbal behavior during the interaction, such that more constructive nonverbal cues from the partner, as objectively coded by independent raters, were associated with positive shifts in one's explicit evaluations. People's explicit evaluations were not associated with their partners' verbal behavior, however, and none of these two types of behaviors were related to changes in implicit evaluations.

Together, these findings corroborate the results obtained with participants' subjective evaluations, in that implicit partner evaluations did not appear to change in response to the behaviors exhibited by their partner during the conversation. In contrast, changes in explicit evaluations were more strongly linked with their partner's nonverbal (but not verbal) behavior as observed by independent raters. Because these data are part of another manuscript, we only report them here to rule out alternative explanations and gain confidence in our findings.

Table S3. Multilevel Models for Changes Pre-/Post-Conversation in IPEs and EPEs

Model	B	*SE*	*df*	*t*	*p*	95% CI
Outcome: Post-Conversation IPEs						
Pre-Conversation IPEs	0.29	0.06	226.62	4.53	<.001	[0.16; 0.41]
Verbal Behavior	0.01	0.06	173.18	0.17	.866	[-0.11; 0.13]
Nonverbal Behavior	-0.02	0.06	139.87	-0.37	.713	[-0.14; 0.10]
Outcome: Post-Conversation EPEs						
Pre-Conversation EPEs	0.64	0.05	188.33	12.77	<.001	[0.54; 0.74]
Verbal Behavior	0.07	0.05	201.47	1.37	.171	[-0.03; 0.17]
Nonverbal Behavior	0.12	0.05	160.05	2.32	.021	[0.02; 0.22]

PILOT FOR STUDY 2

Prior to initiating our main longitudinal project, we conducted a pilot study that aimed to pre-test our planned measure of implicit partner evaluations within the context of a daily diary design. As compared to other implicit measures, the Affect Misattribution Procedure (Payne et al., 2005) is unique in its simplicity of implementation (see Payne & Lundberg, 2014), which makes it a good candidate for brief administrations that are integrated into participants' everyday lives. Moreover, in the specific domain of romantic relationships, versions of the AMP using current and former romantic partners as primes have demonstrated strong incremental validity and high internal reliability, and appeared to outperform other implicit measures that used relative comparisons (e.g., partner vs. stranger IAT; Banse et al., 2013; Imhoff & Banse, 2010). However, to ensure that a partner AMP would show similarly satisfactory indicators of internal consistency over multiple brief assessments, we conducted a short pilot diary study in which we measured individuals' implicit partner evaluations daily and compared two different variants of the AMP.

1. Method

1.1. Participants

We recruited 18 opposite-sex romantic couples in Cologne, Germany, and its surroundings through various approaches (i.e., flyers, social networks, etc.) to participate in a 5-day diary phase. Individuals (N = 36) were required to speak fluent German, be involved in a romantic relationship for at least 4 months, and see their partner on daily basis. This sample was composed of 57% students and 43% full-time workers, whose age ranged from 20 to 55 years-old (M = 27.26, SD = 6.94). Relationship length varied from 6 months to 28 years (M = 56.22 months, SD = 75.01), and twenty couples were living together and 4 were married.

1.2. Procedure and Materials

Similar to in our main study, couples were first scheduled an intake laboratory appointment in which they provided consent and were instructed about the diary study. Moreover, pictures of both couple members were taken to generate the stimuli for the implicit measure (see Study 2 for further details). Each evening for 5 days, individuals received an email that contained a link to perform an online survey as well as an Affect Misattribution Procedure (AMP; Payne et al., 2005) on Inquisit (Millisecond, 2015). This computer-based task assesses the extent to which brief exposure to picture primes affects participants' evaluations of the pleasantness of Chinese pictographs (see Study 2 for further explanation about this task). In this task, we used four different types of picture primes: the self (i.e., 4 pictures of the participants' front face, profile, full body standing up, upper body sitting down), the partner (i.e., 4 pictures of the participants' partner's front face, profile, full

body standing up, upper body sitting down), attractive opposite-sex alternatives (i.e., 4 faces selected by the participants at Intake), and a neutral category (i.e., a grey square). All types of primes and stimuli were equally presented in random order. For this pilot study, we designed two different versions of AMP to examine the potential impact of trial numbers on reliability indices: a short AMP that included 64 test trials (i.e., 16 trial per prime type) and a long AMP that included 92 trials (i.e., 24 trials per prime type). During this 5-day diary, participants were randomly assigned to either of these two AMP versions on a daily basis. Despite some attrition and technical issues, we were able to collect 123 valid observations from 30 individuals.

2. Results

Descriptive statistics and reliability indices are displayed in Table S4. First, in both versions, participants rated Chinese pictographs as more pleasing when preceded by a partner prime than when preceded by neutral primes; specifically, multilevel regression models revealed that prime type (coded -1 for neutral and +1 for partner) significantly predicted the proportion of pleasant ratings in the short (b = 6.94, SE = 2.01, 95% CI [2.93; 10.95], p = .001) and the long AMP versions (b = 5.81, SE = 1.44, 95% CI [2.94; 8.69], p < .001). Second, the two versions did not show significant differences in pleasant ratings for both prime types, as revealed by multilevel models regressing the aggregated proportion of pleasant ratings for partner and neutral trials onto a dummy-coded variable (-1 for short and +1 for long version), respectively b = -0.31, SE = 1.44, 95% CI [-3.17; 2.54], p = .828, and b = -1.51, SE = 1.60, 95% CI [-4.68; 1.66], p = .348. However, notable differences in reliability were observed between the two AMP versions. For partner primes, the long AMP version showed good levels of internal consistency (overall α = .80) whereas the short AMP version appeared to be less reliable (overall α = .63). However, for neutral primes, the short AMP version achieved better reliability than the longer version (overall αs = .82 and .68, respectively).

3. Discussion

Altogether, results from this pilot study corroborated previous research on close relationships (Banse et al., 2013) and in other domains (Payne & Lundberg, 2014) in showing that the AMP may be a suitable and reliable tool to assess individuals' implicit partner evaluations, even when implemented on a daily basis and in participants' natural environment (i.e., from their home computers). Given that our primary interest was devoted to capturing people's spontaneous reactions to their partner (vs. neutral) primes, these data further suggested that a longer AMP version (i.e., with at least 24 trials per prime type) may be more preferable over shorter versions including fewer trials. Thus, to combine the strengths of both versions – that is, the brief administration of the short AMP version in daily life (i.e., 64 trials for about 2 minutes) and the higher reliability achieved by the long AMP version – in our main study, we decided to always use a minimum of 24 trials per prime type for all assessments (as in the long version) and to drop prime type

categories (e.g., self, attractive alternatives) when necessary to ensure a quick completion of the task.

Table S4. Descriptive Statistics and Internal Consistency for IPEs Measures (short vs. long AMP versions) in Pilot Study

	Short AMP				Long AMP			
	N	***M***	***SD***	**α**	***N***	***M***	***SD***	**α**
	Partner Primes				**Partner Primes**			
Overall	12.40	71.03	18.41	.63	12.20	65.52	20.08	.80
Day 1	14	70.01	21.50	.56	16	69.15	24.50	.92
Day 2	15	71.67	22.69	.81	10	67.44	17.73	.84
Day 3	11	72.69	19.43	.54	13	62.60	17.68	.61
Day 4	16	69.46	18.13	.53	8	63.31	16.60	.75
Day 5	6	72.92	21.16	.62	14	63.98	21.95	.77
	Neutral Primes				**Neutral Primes**			
Overall	12.40	58.83	24.86	.82	12.20	54.19	18.41	.68
Day 1	14	58.34	28.18	.82	16	54.18	22.63	.77
Day 2	15	54.01	30.17	.92	10	52.33	20.10	.70
Day 3	11	59.93	17.66	.45	13	57.00	17.66	.69
Day 4	16	58.25	25.44	.88	8	56.60	14.02	.53
Day 5	6	61.18	17.17	.50	14	51.53	16.64	.62

Note. Overall indices are statistics averaged across the 5 days. Long (vs. short) AMP included 24 trials (vs. 16) per prime type, for a total of 96 test trials (vs. 64). As in our main study, we followed Bar-Anan & Nosek's (2014) procedure to estimate the internal consistency of both AMP (short vs. long) at all measurement times by computing Cronbach's alphas from three data parcels. That is, for each AMP assessment, we divided the total amount of trials into three parcels -- the first (vs. second vs. third) parcel included the first (vs. second vs. third) item of each triplet of consecutive trials for each prime type (i.e., partner and neutral) – and then computed the proportion of pleasant ratings for both primes in each parcel and finally used these three scores to estimate the reliability estimates.

STUDY 2

1. List of Previous Publications

The following publication referred to the same dataset presented in Study 2. However, this article addressed different research questions that are not central to the hypotheses tested in present investigation and, thus, will not be discussed further.

Hicks, L. L., McNulty, J. K., Faure, R., Meltzer, A. L., Righetti, F., & Hofmann, W. (2020). Do people realize how their partners make them feel? Relationship enhancement motives and stress determine the link between implicitly assessed partner attitudes and relationship satisfaction. *Journal of Personality and Social Psychology*. Advance online publication. https://doi.org/10.1037/pspi0000247

2. Sample

In line with current recommendations (Finkel et al., 2015), the sample size for Study 2 was defined before data collection, based on our financial and recruitment constraints, and combined with a within-person diary and longitudinal design to provide adequate statistical power. To be eligible, participants were required to (a) be exclusively committed to their partner for 4 months or more, (b) be 18 years of age or older, (c) see each other on a daily basis, and (d) be fluent in Dutch. Participants received an 50€ compensation for completing all study parts.

3. Affective Misattribution Procedure (AMP)

The AMP script was retrieved and adjusted from the Millisecond library (https://www.millisecond.com/download/library/amp/).

4. Diary Measures

- Explicit partner evaluations (1 item; "Right now, how would you evaluate your partner?"; 1 = *extremely negatively*, 9 = *extremely positively*)
- Perceived responsiveness (2 items; "Today, my partner understood me" and "Today, my partner behaved caringly and attentively toward me"; 1 = *not at all*, 7 = *completely*, r = .59),
- Perceived gratitude (1 item; "Today, my partner expressed gratitude for what I have done for him/her"; 1 = *not at all*, 7 = *completely*)
- Perceived goal support (1 item; "Today, my partner helped me make progress toward my personal goals"; 1 = *not at all*, 7 = *completely*)
- Humor (1 item; "Today, I shared playful and funny moments with my partner"; 1 = *not at all*, 7 = *completely*)
- Exciting shared activities (1 item; "Today, my partner and I did exciting activities together (other than sex)"; 0 = *no*, 1 = *yes*)
- Sexual activity (1 item; "Today, my partner and I had sexual intercourse"; 0 = *no*, 1 = *yes*)
- Sexual satisfaction (1 item; "Today, I am satisfied with our sexual activities"; 1 = *not at all*, 7 = *completely*)
- High-maintenance interactions (1 item; "Today, maintaining efficient, well-coordinated interaction with my partner required a lot of energy (compared to smooth and effortless interaction)"; 1 = *not at all*, 7 = *completely*)
- Perceived jealousy (1 item; "Today, I felt romantically jealous because of my partner's attention or behavior toward someone else"; 1 = *not at all*, 7 = *completely*)
- Conflict (1 item; "Today, I encountered a conflictual situation or I had an argument with my partner"; 0 = *no*, 1 = *yes*)
- Conflict intensity (1 item; How intense was this conflict?"; 1 = *not at all*, 7 = *very much*)
- Criticism (1 item; "Today, I criticized or insulted my partner"; 1 = *not at all*, 7 = *completely*)

- Hurtful behavior (1 item; "I hurt my partner's feelings"; 1 = *not at all*, 7 = *completely*)
- Attempts to change the partner (1 item; "Today, I tried to change my partner into the person I would like him/her to be"; 1 = *not at all*, 7 = *completely*)

5. Follow-Up Measures

- Breakup (1 item; "Are you and your partner still in a relationship?"; 1 = *yes*, 2 = *no*)
- Explicit ex-partner evaluations (1 item; "How would you evaluate your ex-partner?" (1 = *extremely negatively*; 9 = *extremely positively*)
- Explicit partner evaluations (5 items; "I like my partner very much", "I feel a lot of positive affect towards my partner", "I esteem my partner very much", "I love my partner", "My partner is a very valuable person"; 1 = *not at all*, 7 = *completely*).

In the past 4 months… (if still together only)

- Perceived support (1 item; "When something bad happened to me, I felt that my partner supported me"; 1 = *not at all*, 7 = *completely*)
- Humor (1 item; "How often have you experienced humor and playful moments with your partner?"; 1 = *not at all*, 7 = *very often*)
- Sexual frequency (1 item; "On the average week, what best describes how often you and your partner engage in sexual activities together?"; 1 = *less than once per week*, 7 = *seven times or more per week*)
- Sexual satisfaction (1 item; "How satisfied are you with your sexual activity (in a way that your sexual needs and expectations are currently met)?"; 1 = *not at all*, 7 = *completely*)
- Frequency of shared activities (1 item; "How often have you done exciting activities together with your partner?"; 1 = *not at all*, 7 = *very often*)
- Intensity of shared activities (1 item; "How exciting were these activities?"; 1 = *not at all*, 7 = *completely*)
- Conflict frequency (1 item; "How often have you had conflicts or arguments with your partner?"; 1 = *not at all*, 7 = *very often*)
- Conflict intensity (1 item; "How intense would you evaluate these conflicts/arguments?"; 1 = *not at all*, 7 = *very much*).
- Jealousy (1 item; "I felt romantically jealous because of my partner's attention or behavior"; 1 = *not at all*, 7 = *very often*)
- Perceived aggressiveness (1 item; "How aggressive have you perceived your partner's reactions, attitudes and behaviors to be?"; 1 = *not at all*, 7 = *very much*)

6. Supplemental Tables

Table S5. Node Degree and Strength from the Contemporaneous Step of a Multilevel Network with IPEs, EPEs and Daily Relationship Experiences

Node	Degree	Strength
IPEs	0	0.00
EPEs	6	0.67
Neutral AMP	1	0.04
Pos. Resp. Behavior	6	0.98
Sexual Satisfaction	3	0.33
Shared Activities	5	0.38
Conflict Intensity	4	0.52
HMI	1	0.05
Jealousy	4	0.53

Note. Node degree corresponds to the number of significant edges connecting one node to other nodes. The edge between two nodes was considered significant if either node *i* was a significant predictor ($p < .05$) of node *j* after controlling for all remaining variables, or vice versa. Strength is computed from the sum of significant partial correlations between a node and all other nodes. IPEs = implicit partner evaluations, EPEs = explicit partner evaluations, Pos. Resp. Behavior = positive and responsive partner behavior, HMI = high maintenance interaction.

7. Supplemental Analyses

7.1. Replicating Analyses with Partner-Reported Daily Experiences Variables

An alternative explanation for the patterns of results observed for RQ 2 and RQ 3 (i.e., that EPEs were more closely related to same-day relationship experiences than were IPE), could be that EPEs and self-reported relationship experiences exhibit shared method variance (Orth, 2013). Whereas IPEs were measured using a computerized task, both EPEs and couple experiences were self-reported using a similar survey format, which could inflate their covariance. Shared method variance could result from multiple sources, one of which is participant's stable response tendencies (e.g., a general tendency to give positive ratings). This source is already controlled for in the preceding analyses, as predictors are always person-centered (removing the influence of stable person-level patterns). However, people may also have day-to-day fluctuations in their broad response tendencies (e.g., a person who is in a particularly good mood may offer more positive responses on all self-report

measures, compared to their own mean).[30] To address this possibility, we re-conducted all analyses that originally used participant's reports of the day's relationship experiences (i.e., sections RQ 2 and RQ 3) with the partner's reports of these same experiences, when possible, which should be less subject to these sources of shared method variance.[31]

7.1.1. Measures.

Daily Relationship Experiences. Partners were asked about the degree to which they experienced positive and negative relationships experiences with the participant during the day. For positive experiences, the partner-reported version of the *positive and responsive partner behavior* composite aggregated measures of loving behavior ("I behaved in a loving way toward my partner"), felt gratitude ("I felt very grateful for what my partner has done for me"), and shared humor (one item; "Today I shared playful and funny moments with my partner"). All items were rated on a seven-point scale (1 = *not at all*, 7 = *extremely*). These three items were then z-standardized and averaged to create a composite score. Multilevel reliability analysis following the approach recommended in Preacher and colleagues (2010) showed relatively low internal consistency at the within-person level, α_{within} = .61, and adequate reliability at the between-person level, $\alpha_{between}$ = .84.[32] For our second partner-reported measure of positive experiences, *sexual activity*, partners reported whether they had sexual intercourse with the participant that day (0 = *no,* 1 = *yes*). Finally, for the third measure, *exciting shared activities,* partners were asked whether or not they had engaged in exciting joint activities other than sex (e.g., travel, sports, taking a walk, going out to eat, attending arts events, concerts, or movies, going to a party, etc.) with the participant that day (0 = *no,* 1 = *yes*).

30 Two members of a couple could also be similar in their generalized response tendencies (e.g., if people assortatively mate on personality characteristics that would lead to positivity bias or acquiescence). This stable dyadic response tendency would also be controlled for by using person-centered scores. The one component of shared method variance that these analyses cannot eliminate is the fluctuations in day-to-day response tendencies that two partners might share. This is mainly a concern if covariation is driven by factors exogenous to the relationship—e.g., if both people responded more positively on a specific diary day because of good weather. If partners covary in response positivity because of inherently relational phenomena (e.g., having a nasty fight), this would then be variance that we would want to capture, rather than eliminate.

31 For one construct, jealousy, we could not re-conduct these analyses as partners did not indicate the degree to which they induced jealous feelings in their partner. However, one additional construct, partner's destructive behavior, could only be included in these analyses as it was only assessed using participant's reports of their own behavior toward the partner.

32 We used the same item for both actor and partner reports in cases when it appeared that the reports would reflect experience that was shared by the actor and partner (e.g., sex, conflict, shared humor). In cases where reports of a relationship experience either referred to a personal reaction to a shared experience (e.g., whether sex was satisfying) or a relationship experience that was directed from one partner to another (e.g., expressed gratitude) we attempted to find a different but parallel item that would reflect the actor's experience despite using the partner's report (e.g., partner's felt gratitude was substituted for actor's perception of the partner's gratitude). If such an item was not available, we omitted that construct.

Similarly, partner-reported negative relationship experiences were divided into three different constructs: conflict, high maintenance interaction, and destructive behavior. First, *conflict intensity* corresponded to whether the partner reported conflict with the participant that day (one item; "I encountered a conflictual situation or I had an argument with my partner"; 0 = *no,* 1 = *yes*) and, if so, to the intensity of this conflict (one item; "How intense was this conflict?"; 1 = *not at all*, 7 = *very much*). The overall conflict intensity score was 0 if the partner reported no conflict and was equal to the conflict intensity rating if they had reported conflict, for a total possible range of 0-7. Our second partner-reported negative construct, *high maintenance interaction* (HMI), corresponded to the single item "Maintaining efficient, well-coordinated interaction with my partner required a lot of energy (compared to smooth and effortless interaction" (1 = *not at all*, 7 = *extremely*). Finally, we included one additional negative construct, *partner destructive behavior*, which was reported only by the partner. That is, we used the partners' reports of engaging in behaviors that are known to undermine relationship quality, such as attempts to change the participant in line with the partner's own ideals ("I tried to change my partner into the person I would like him/her to be"), criticism of the participant ("I criticized or insulted my partner") and hurtful behavior toward the participant ("I hurt my partner's feelings"; all scored 1 = *not at all*, 7 = *extremely*). Multilevel reliability analysis showed relatively low internal consistency at the within-person level, α_{within} = .67, and adequate reliability at the between-person level, $\alpha_{between}$ = .84.

7.1.2. Results.

Multilevel Linear Models: Partner Reports. The results reported in the main text suggest that explicit, rather than implicit, partner evaluations are more robustly linked to daily relationship experiences. To assess whether these findings are robust in the absence of shared method variance, we computed a parallel set of analyses in which actor's IPEs and EPEs were predicted by person-centered partner reports of daily relationship experiences.[33] As described previously, this included six types of daily relationship experiences: positive and responsive partner behavior, sexual intercourse, shared activities, conflict intensity, high-maintenance interaction, and the partner's destructive behavior.[34]

Consistent with the findings derived from actor reports, partner-reported daily experiences generally had weak associations with IPEs (*pseudo-*R^2 < .001). IPEs showed a

33 We chose to conceptualize these results as an alternative assessment of how shared relationship experiences covaried with IPEs and EPEs, rather than as an assessment of "partner effects" of these experiences on IPEs and EPEs. We believe this is justified because the selected variables likely tap shared experiences (e.g., the joint experience of sex, conflict, humor, and so on). Therefore, unlike in a prototypical actor-partner analysis in which there are two conceptually distinct underlying variables (e.g., actor extraversion and partner extraversion) which may each have an independent impact on an outcome, we propose that actor and partner reports of a relationship experience are better conceptualized as two measurements of a single latent construct.

34 Actor-reported and partner-reported experiences were generally moderately-to-strongly associated (with regard to the five constructs for which it was possible to generate both actor and partner composites). Specifically, daily person-centered actor and partner reports had a correlation of r = .42 for positive communication, r = .84 for sexual satisfaction (actor) and sex (partner), r = .71 for shared activities, r = .54 for conflict intensity, and r = .21 for high-maintenance interaction (all ps <.001).

small positive association with positive and responsive behavior (B = 0.56, SE = 0.25, t = 2.21, p = .027), but no other partner-reported daily experiences. This indicates that on days when partners reported engaging in especially high levels of loving behavior, gratitude, and shared humor (compared to what was typical for them), the participant tended to show more positive implicit partner evaluations.

In contrast, daily EPEs were robustly associated with partner-reported daily relationship experiences. As can be seen in Table S6, all six partner-reported relationship experiences were associated with EPEs (with higher-than-typical levels of positive and responsive behavior, sexual intercourse, and shared activities associated with more-positive EPEs, and higher-than-typical levels of conflict intensity, high-maintenance interaction and partner destructive behavior associated with less-positive EPEs), although these associations were small in magnitude. In total this model accounted for a small percentage of the variance in EPEs (but substantially more than the variance explained in IPEs), *pseudo-*R^2 = .05.

In sum, findings from analyses predicting IPEs and EPEs from daily relationship experiences were broadly consistent regardless of whether these experiences were reported by actors or partners. While the associations between daily relationship experiences and EPEs appeared to be directionally weaker when using partner reports (e.g., B = 0.56 vs. 0.90 for positive and responsive behavior), which is generally the case in relationship research (e.g., Joel et al., 2020; Orth, 2013), the links between EPEs and partner-reported daily experiences were nevertheless much more consistent than the links between IPEs and these same experiences.

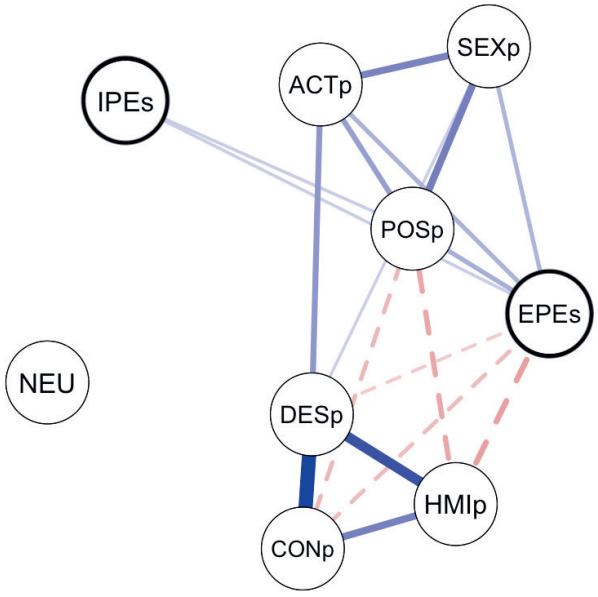
Table S6. Multilevel Models Predicting IPEs and EPEs from Partner Reports of Daily Relationship Experiences

Outcome: IPEs					
	B	***SE***	***df***	***t***	***p***
Intercept	72.29	1.42	2676	50.98	< .001
Neutral AMP	0.13	0.21	2676	0.60	.550
Pos. Resp. Behavior	0.56	0.25	2676	2.21	.027
Sexual Intercourse	-0.33	0.22	2676	-1.50	.134
Shared Activities	0.11	0.23	2676	0.49	.621
Conflict Intensity	-0.11	0.26	2676	-0.42	.677
HMI	-0.01	0.24	2676	-0.03	.974
Destr. Behavior	0.30	0.25	2676	1.18	.239
Outcome: EPEs					
	B	***SE***	***df***	***t***	***p***
Intercept	7.67	0.06	3691	119.74	< .001
Pos. Resp. Behavior	0.13	0.02	3691	8.50	< .001
Sexual Satisfaction	0.04	0.01	3691	2.83	.005
Shared Activities	0.04	0.01	3691	3.01	.003
Conflict Intensity	-0.09	0.02	3691	-5.37	< .001
HMI	-0.07	0.01	3691	-4.54	< .001
Destr. Behavior	-0.05	0.02	3691	-3.35	.001

Note. Multilevel models predicting implicit partner evaluations (top panel) and explicit partner evaluations (bottom panel) from same-day person-centered partner reports of daily relationship experiences. IPEs = implicit partner evaluations, EPEs = explicit partner evaluations, Pos. Resp. Behavior = positive and responsive partner behavior, HMI = high maintenance interaction, Destr. Behavior = destructive partner behavior. IPEs are measured on a 0-100 scale; EPEs are measured on a 1-9 scale.

Multilevel Network Analyses: Partner Reports. We used multilevel network analysis as a second approach for assessing the strength of ties between within-person fluctuations in daily relationship experiences and implicit and explicit partner evaluations. Our model included ten variables: Six partner-reported relationship experiences variables, IPEs, EPEs, and pleasantness ratings following neutral primes on the AMP. Here we focus on the contemporaneous network.

Figure S1. Contemporaneous Network Including IPEs, EPEs, and Partner-Reported Relationship Experiences



Note. Visualization of the contemporaneous step of a multilevel network mapping same-day associations between partners' reports of positive and negative relationship experiences and individuals' implicit partner evaluations, explicit partner evaluations, and their proportion of pleasant ratings following neutral primes, using daily person-centered scores residualized on prior days' scores for all network variables. POSp = positive and responsive partner behavior, SEXp = sexual intercourse, ACTp = shared activities, CONp = conflict intensity, HMIp = high-maintenance interaction, DESp = partner destructive behavior, EPEs = explicit partner evaluations, IPEs = implicit partner evaluations, NEU = AMP pleasant ratings following neutral primes.

As can be seen in Figure S1, in the contemporaneous network daily IPEs (removing between-person differences as well as all lag-1 influences) were associated with partner's reports of their own positive and responsive behavior (partial $r = .05$), as well as with daily EPEs (partial $r = .05$). EPEs showed same-day associations with all six experiences: positive and responsive behavior, sexual intercourse, and shared activities (positive), and conflict intensity, high-maintenance interaction, and destructive behavior (negative). Thus, EPEs appeared to both have a higher degree than IPEs (i.e., to be connected to a greater number of other nodes), and also to have greater strength (i.e., the sum of significant edge weights connecting EPEs to other network nodes, 0.52, was higher than the sum of edge weights for IPEs, 0.10; see Table S7).

Table S7. Node Degree and Strength from the Contemporaneous Step of a Multilevel Network with IPEs, EPEs, and Partner-Reported Daily Relationship Experiences

Node	Degree	Strength
IPEs	2	0.10
EPEs	7	0.52
Neutral AMP	0	0.00
Pos. Resp. Behavior	6	0.55
Sexual Intercourse	4	0.40
Shared Activities	4	0.43
Conflict Intensity	4	0.59
HMI	4	0.56
Destructive Behavior	5	0.72

Note. Node degree corresponds to the number of significant edges connecting one node to other nodes. The edge between two nodes was considered significant if either node *i* was a significant predictor ($p < .05$) of node *j* after controlling for all remaining variables, or vice versa. Strength is computed from the sum of significant partial correlations between a node and all other nodes. IPEs = implicit partner evaluations, EPEs = explicit partner evaluations, Pos. Resp. Behavior = positive and responsive partner behavior, HMI = high-maintenance interaction.

Aggregated Analyses: Partner Reports. We sought to assess whether implicit and explicit partner evaluations would show stronger associations with an index of partner-reported relationship experiences to the extent that such index incorporates experiences accumulated over a greater number of prior days. As described in the main text, we calculated *aggregated experience* scores for each of the six partner-reported daily experiences variables by computing the mean of the partner's grand-mean-centered reports of that relationship experience across that day and all prior diary days.

To test whether implicit and explicit partner evaluations were more strongly linked to positive and negative partner-reported relationship experiences when longer stretches of past experiences were considered, we estimated a series of twelve models. In each, implicit or explicit partner evaluations were predicted from aggregated experience scores for one of the six partner-reported relationship experiences variables, day (coded from 0-13, with 0 being the first diary day), and the interaction of aggregated score and day. If the link between relationship experiences and partner evaluations is stronger when partner-reported experiences are aggregated across a greater number of days, we would expect to see a positive interaction between aggregated score and day.

The results of these models are summarized in Table S8. Two of the six models predicting IPEs included a significant interaction between aggregated score of partner-reported dyadic experiences (specifically, positive and responsive behavior and high-maintenance interaction) and day. That is, for these two relationship experiences, our findings suggest that relationship between these aggregated partner-reported experiences and implicit partner evaluations is stronger over longer rather than shorter periods. Conversely, none of the six models included a significant main effect of the aggregated experience score.

For EPEs, none of the six models included a significant interaction between aggregated score and day. Consistent with the classical multilevel models reported in the previous section, five out of six models predicting explicit partner evaluations (i.e., all except shared activities) included a significant main effect of the aggregated partner-reported experiences score, implying that aggregated scores were associated with explicit partner evaluations even by the first diary day (which only included same-day partner reports).

Table S8. Aggregated Partner-Reported Daily Experiences Predicting IPEs and EPEs

Outcome: IPEs										
	Main effect of aggregated score					**Interaction of day with aggregated score**				
	B	***SE***	***df***	***t***	***p***	**B**	***SE***	***df***	***t***	***p***
Pos. Resp. Behavior	-0.89	0.78	2984	-1.14	.253	0.28	0.08	2984	3.50	< .001
Sexual Intercourse	-0.51	0.66	2970	-0.77	.439	0.19	0.12	2970	1.49	.137
Shared Activities	0.53	0.60	2983	0.88	.382	-0.06	0.12	2983	-0.51	.610
Conflict	-0.35	0.68	2984	-0.52	.604	-0.01	0.13	2984	-0.11	.913
HMI	-0.19	0.68	2984	-0.27	.785	-0.25	0.08	2984	-3.10	.002
Destr. Behavior	0.29	0.65	2984	0.44	.660	0.00	0.08	2984	-0.02	.982
Outcome: EPEs										
	Main effect of aggregated score					**Interaction of day with aggregated score**				
	B	***SE***	***df***	***t***	***p***	**B**	***SE***	***df***	***t***	***p***
Pos. Resp. Behavior	0.33	0.06	2988	5.97	< .001	0.01	0.01	2988	1.56	.118
Sexual Intercourse	0.22	0.05	2974	4.22	< .001	0.02	0.01	2974	1.64	.102
Shared Activities	0.04	0.05	2987	0.89	.374	0.00	0.01	2987	0.33	.741
Conflict	-0.26	0.05	2988	-5.03	< .001	-0.01	0.01	2988	-1.13	.260
HMI	-0.28	0.05	2988	-5.70	< .001	-0.01	0.01	2988	-1.27	.204
Destr. Behavior	-0.21	0.05	2988	-4.57	< .001	0.00	0.01	2988	0.40	.691

Note. Summary of results from twelve multilevel models predicting implicit partner evaluations (top panel) and explicit partner evaluations (bottom panel) from aggregated partner reports of relationship experiences, day, and the interaction between aggregated scores and day (controlling for AMP pleasantness ratings following neutral primes). IPEs = implicit partner evaluations, EPEs = explicit partner evaluations, Pos. Resp. Behavior = positive and responsive partner behavior, HMI = high maintenance interaction. IPEs are measured on a 0-100 scale; EPEs are measured on a 1-9 scale.

Together, these findings are relatively consistent with those involving actors' reports and further support the implicit updating-resistance perspective. On the one hand, explicit partner evaluations appeared to covary consistently and robustly with the relationship experiences that individuals encounter on a day-to-day basis with their partner but seem insensitive to the gradual accumulation of these positive and negative experiences over the course of two weeks. On the other hand, same-day partner-reported relationship experiences generally did not show a strong association with individuals' implicit partner evaluations. Instead, implicit partner evaluations sometimes appeared to be associated

with the accumulation of particular partner-reported relationship experiences over the 14-day diary phase (specifically, for positive and responsive behavior and high-maintenance interaction).

7.2. Aggregated Over-Time Analysis From Follow-Up

This longitudinal project also included three follow-up waves that assessed various relationship experiences every four months. Given that the scope of this investigation focuses on how quickly IPEs and EPEs respond to daily relationship experiences, we did not include these data in the main text. However, because they may arguably provide another index of aggregated relationship experiences (i.e., individuals' perceptions of their interactions with their partner over the past 4 months) that is different from the one created in the diary phase (i.e., objective aggregated score of individuals' daily reports over a two-week period), we report these data as supplementary analyses. In these analyses, we assess whether implicit and explicit partner evaluations are better predicted by participant's aggregated over-time experience of relationship experiences (as compared to only the most recent occurrences of those experiences) across the three waves of the 12-month follow-up period.

7.2.1. Measures.

Relationships Experiences—Follow-Up. Participants were asked about the degree to which they experienced positive and negative relationships experiences with their partner over the prior four months. The follow-up version of the *positive and responsive partner behavior* composite aggregated measures of perceived support ("When something bad happened to me, I felt that my partner supported me", 1 = *not at all*, 7 = *completely*), and shared humor ("How often have you experienced humor and playful moments with your partner?"; 1 = *not at all*, 7 = *very often*). These two items were then standardized and averaged to create a composite score, multilevel $r = .21$.

For our second follow-up measure of positive experiences, *sexual satisfaction*, participants reported their degree of sexual satisfaction over the prior four months ("How satisfied are you with your sexual activity (in a way that your sexual needs and expectations are currently met)?"; 1 = *not at all*, 7 = *completely*). Finally, the third measure, *exciting shared activities,* was a composite of frequency of shared activities over the prior four months ("How often have you done exciting activities together with your partner?"; 1 = *not at all*, 7 = *very often*) and the level of excitement regarding these activities ("How exciting were these activities?"; 1 = *not at all*, 7 = *completely*). These two items were then standardized and averaged to create a composite score, multilevel $r = .57$.

The follow-up version of the *conflict intensity* construct was a composite of reported conflict frequency ("How often have you had conflicts or arguments with your partner?"; 1 = *not at all*, 7 = *very often*) and conflict intensity ("How intense would you evaluate these conflicts/arguments to be?"; 1 = *not at all*, 7 = *very much*). The second negative follow-up relationship experience was *jealousy* ("I felt romantically jealous because of my partner's

attention or behavior"; 1 = *not at all*, 7 = *very often*). The final negative experience assessed during the follow-up period was *destructive partner behavior* ("How aggressive have you perceived your partner's reactions, attitudes and behaviors to be?"; 1 = *not at all*, 7 = *very much*).

Computing Aggregate Follow-Up Scores. We assessed whether implicit and explicit partner evaluations would show stronger associations with an index of relationship experiences to the extent that the index incorporated reports of experiences from a greater number of prior follow-up waves. We calculated *aggregated experience* scores for the six relationship experiences variables (five of which mirror those from the diary period), by computing the mean of the participant's grand-mean-centered scores for that relationship experience at that wave and across all prior waves. Thus, at wave 1, the aggregated score reflected only same-wave information about the relationship experience (which in itself was intended to reflect participants' experiences from the prior 4 months); at wave 3, the aggregated score aggregated the extent to which the participant had encountered that relationship experience on waves 1, 2, and 3 (or a rough proxy for their experiences over a total of 12 months).

7.2.2. Results.

To test whether implicit and explicit partner evaluations were more strongly linked to positive and negative relationship experiences when longer stretches of past experiences were taken into account, we estimated a series of twelve models. In each, implicit or explicit partner evaluations were predicted from aggregated experience scores for one of the six follow-up experiences variables, wave (coded from 0-2, such that 0 represented the first wave), and the interaction of aggregated score and wave. If the link between relationship experiences and partner evaluations is stronger when experiences are aggregated across a greater number of follow-up waves, we would expect to see an interaction between aggregated score and wave (which should be positive for positive experiences and negative for negative experiences).

Table S9. Aggregated Experiences Across Follow-up Waves Predicting IPEs and EPEs

Outcome: IPEs										
	Main effect					Interaction with wave				
	B	***SE***	***df***	***t***	***p***	**B**	***SE***	***df***	***t***	***p***
Pos. Resp. Beh.	1.20	1.34	381	0.89	.374	-0.04	0.79	381	-0.05	.964
Sexual Satisfaction	3.95	1.39	381	2.84	.005	-1.02	0.78	381	-1.31	.192
Shared Activities	4.47	1.24	381	3.60	< .001	-0.88	0.79	381	-1.12	.265
Conflict Intensity	1.88	1.42	381	1.33	.186	-0.09	0.81	381	-0.11	.914
Jealousy	1.51	1.32	381	1.14	.253	-0.05	0.82	381	-0.06	.949
Aggression	0.86	1.32	381	0.65	.517	0.46	0.82	381	0.57	.570
Outcome: EPEs										
	Main effect					Interaction with wave				
	B	***SE***	***df***	***t***	***p***	**B**	***SE***	***df***	***t***	***p***
Pos. Resp. Beh.	0.29	0.03	378	10.44	< .001	0.02	0.02	378	1.03	.303
Sexual Satisfaction	0.14	0.03	378	4.26	< .001	-0.02	0.02	378	-0.82	.414
Shared Activities	0.18	0.03	378	6.27	< .001	-0.01	0.02	378	-0.30	.766
Conflict Intensity	-0.21	0.03	378	-6.79	< .001	-0.04	0.02	378	-2.14	.033
Jealousy	-0.09	0.03	378	-2.90	.004	-0.05	0.02	378	-2.77	.006
Aggression	-0.17	0.03	378	-5.88	< .001	-0.03	0.02	378	-1.74	.082

Note. Summary of results from twelve multilevel models predicting IPEs (top panel) and EPEs (bottom panel) from aggregated reports of relationship experiences across follow-up waves, wave, and the interaction between aggregated scores and wave (controlling for AMP pleasantness ratings following neutral primes). IPEs = implicit partner evaluations, EPEs = explicit partner evaluations, Pos. Resp. Behavior = positive and responsive partner behavior. IPEs are measured on a 0-100 scale; EPEs are measured on a 1-7 scale.

The results of these models are summarized in Table S9. Two of the six models predicting IPEs (i.e., using sexual satisfaction and shared activities as predictors) included a significant main effect of the aggregated experience score. None of the six models predicting IPEs included a significant interaction between aggregated score of relationship experiences and wave. Thus, when participants reported higher sexual satisfaction or more exciting shared activities over the prior four months, they tended to have more positive implicit partner evaluations at the same wave. Aggregating across additional follow-up waves did not appear to add substantial value in accurately predicting IPEs for any of the six relationship experiences.

For EPEs, all six models included a significant main effect of the aggregated experiences score, implying that positive and negative relationship experiences were associated with EPEs even when reports from only one wave (i.e., indexing experiences from the prior four months) were used as a predictor. Additionally, all models included a significant negative main effect of wave, such that explicit partner evaluations declined across the twelve months follow-up period (e.g., in a model with only wave predicting EPEs, B = -0.04, SE = 0.02, t = -2.21, p = .028). Two of the six models (specifically, for conflict intensity and jealousy)

included a significant (negative) interaction between aggregated score and wave. Thus, the negative links between EPEs and both conflict intensity and jealousy were stronger when reports from a greater number of waves were included in the aggregate.

These findings suggest that whereas IPEs may be more strongly linked to relationship experiences that accumulate over multiple days or weeks (relative to only the most recent experiences), they may not be more strongly linked to relationship experiences aggregated over many months (e.g., 12 months vs. 8. vs. 4). As in the diary period, participants' reports of the experiences they had encountered in their relationships over the preceding four-to-twelve months were more closely linked with their explicit than implicit partner evaluations.

These findings are qualified by many limitations, however. Notably, the measures used in the follow-up phase were not identical to, and generally proved to be less reliable than, those used in the diary phase, which might account for some of the discrepancies in findings. Moreover, participants were asked to recall their experiences since the prior follow-up assessment (i.e., the prior four months), but the limitations of retrospective memory and motivational biases may have meant that these assessments were skewed toward representing more recent relationship experiences. Hence, it is likely that follow-up scores might not have represented an objective summary of participants' relational interactions, unlike the aggregated scores in the diary phase. Furthermore, while the aggregated effects in the diary phase were the result of up to 14 daily measurements occasions, whereas the current estimates were only based on up to (and often less than) 3 waves from the follow-up part of this study, which might have resulted in reduced variation and increased noise across this small number of waves. Relatedly, drop-out across the year-long follow-up period meant that fewer observations were available for later waves (n = 268 at wave 1, n = 236 at wave 2, and n = 215 at wave 3, out of 348 individuals who started the study), which might have considerably undermined our statistical power to detect the small (interaction) effects that often qualify implicit partner evaluations.

SUPPLEMENTAL MATERIAL FOR CHAPTER 3

1. Previous Publications Using the Same Dataset

The six following publications referred to the same dataset presented in the current work. However, those articles addressed different research questions, which do not theoretically nor empirically overlap with the present manuscript.

Righetti, F., Balliet, D., Visserman, M., & Hofmann, W. (2015). Trust and the Suppression of Emotions During Sacrifice in Close Relationships. *Social Cognition*, *33*(5), 505–519. https://doi.org/10.1521/soco.2015.33.5.505

Righetti, F., Gere, J., Hofmann, W., Visserman, M. L., & Van Lange, P. A. M. (2016). The Burden of Empathy: Partners' Responses to Divergence of Interests in Daily Life. *Emotion*. https://doi.org/10.1037/emo0000163

Righetti, F., Luchies, L. B., van Gils, S., Slotter, E. B., Witcher, B., & Kumashiro, M. (2015). The Prosocial Versus Proself Power Holder: How Power Influences Sacrifice in Romantic Relationships. *Personality and Social Psychology Bulletin*, *41*(6), 779–790. https://doi.org/10.1177/0146167215579054

Righetti, F., & Visserman, M. (2017). I Gave Too Much: Low Self-Esteem and the Regret of Sacrifices. *Social Psychological and Personality Science*. DOI: 10.1177/1948550617707019.

Visserman, M. L., Righetti, F., Impett, E. A., Keltner, D., & Van Lange, P. A. M. (2017). It's the Motive That Counts: Perceived Sacrifice Motives and Gratitude in Romantic Relationships. *Emotion*. https://doi.org/10.1037/emo0000344

Visserman, M. L., Righetti, F., Kumashiro, M., & Van Lange, P. A. M. (2017). Me or Us? Self-Control Promotes a Healthy Balance Between Personal and Relationship Concerns. *Social Psychological and Personality Science*, *8*(1), 55–65. https://doi.org/10.1177/1948550616662121

2. Measures

2.1. Intake

Implicit Partner Evaluations (SC-IAT; Karpinski & Steinman, 2006)

Target Words Used in the SC-IAT			
Original English target words		**Dutch translation**	
Positive	**Negative**	**Positief**	**Negatief**
Beautiful	Angry	Mooi	Boos
Celebrating	Brutal	Vieren	Wreed
Cheerful	Destroy	Blijdschap	Vernietigen
Excellent	Dirty	Uitstekend	Vies
Excitement	Disaster	Opwinding	Ramp
Fabulous	Disgusting	Fantastisch	Walgelijk
Friendly	Dislike	Vriendelijk	Afkeer
Glad	Evil	Verheugd	Kwaadaardig
Glee [a]	Gross	Gelukkig	Onbeschoft
Happy	Horrible	Blij	Verschrikkelijk [c]
Laughing	Humiliate	Lachen	Vernederen
Likeable	Nasty	Aardig	Smerig [c]
Loving	Noxious	Lief	Schadelijk
Marvelous	Painful	Wonderbaarlijk	Pijnlijk
Pleasure	Revolting	Plezier	Weerzinwekkend
Smiling	Sickening [b]	Glimlachen	Smerig [c]
Splendid	Terrible	Schitterend	Verschrikkelijk [c]
Superb	Tragic	Geweldig	Tragisch
Paradise	Ugly	Paradijs	Lelijk
Triumph	Unpleasant	Overwinning	Onaangenaam
Wonderful	Yucky	Prachtig	Bah

Note. Dutch-translated target words per category (attribute words were the partner's first name, last name, and nickname). Few translations have been adjusted to match Dutch language. SC-IAT = Single Category Implicit Association Test.

[a] Translation closer to "Lucky". [b] Translation closer to "Filthy". [c] Translations repeated twice due to overlap in meanings.

Organization SC-IAT				
Block	**Trials**	**Function**	**Left-key response**	**Right-key response**
1_a	24	Practice	Positive words + Partner words	Negative words
2_a	72	Test	Positive words + Partner words	Negative words
3_b	24	Practice	Positive words	Negative words + Partner words
4_b	72	Test	Positive words	Negative words + Partner words

Note. Blocks with a common subscript were experienced as one continuous block.

Relationship Satisfaction (4-item Satisfaction Subscale; Rusbult, Martz, Agnew, 1998)

1. I feel satisfied with our relationship.
2. My relationship is much better than others' relationships.
3. My relationship is close to ideal.
4. Our relationship makes me very happy.

1. Ik voel me tevreden met onze relatie
2. Mijn relatie is veel beter dan de relaties van anderen.
3. Mijn relatie is dicht bij het ideale.
4. Onze relatie maakt mij heel blij.

2.2. After the Conversation

Relationship Satisfaction (1-item)

- I feel satisfied with our relationship

- Ik voel me tevreden met onze relatie

Satisfaction with Conversation Solution (1-item)

- I am satisfied with the solution that we reached during the conversation

- Ik ben tevreden met de oplossing die we hebben bereikt tijdens het gesprek

2.3. Diary

Relationship Satisfaction (1-item)

- Right now, I feel satisfied with our relationship

- Op dit moment, Voel ik me tevreden met onze relatie

3. Coding System

3.1. Description

Among the various existing coding schemes, most of them fail in: (a) assessing nonverbal behavior (e.g., Marital and Family Interaction Coding System (MFICS); Olson & Ryder, 1975; Coding System for Interpersonal Conflict (CSIC; Raush, Barry, Hertel, & Swain, 1974), or (b) focusing on more than a few nonverbal cues (MICSEASE; Griffin, 1993), or (c) creating a fair balance between verbal and nonverbal cues (e.g., Couples Interaction Rating System (CIRS); Heavey, Gill, & Christensen, 1996; Rapid Marital Interaction Coding System (RMICS); Heyman & Vivian, 1993; System for Coding Interactions in Dyads (SCID); Malik & Lindahl, 1997), and (d) equally reflecting all exhibited cues because of categorical and hierarchical coding strategies (e.g., Specific Affect Coding System (SPAFF); Coan & Gottman, 2007; Communication Skills Test (CST); Floyd & Markman, 1984; Couples Interaction Scoring System (CISS); Gottman, 1979; Interactional Coding System (ICS); Hahlweg & Conrad, 1983). Moreover, for most of them, the coding process does not allow to distinguish nonverbal from verbal scores, as their main goal is to assess the overall dyadic interaction rather than specific partners' behaviors (e.g., SPAFF; Coan & Gottman, 2007; CST; Floyd & Markman, 1984; (CIRS); Heavey et al., 1996; RMICS; Heyman & Vivian, 1993; Rapid Couples Interaction Scoring System (RCISS); Krokoff, Gottman, & Hass, 1989; Interaction Dimensions Coding System; Julien, Markman, & Lindahl, 1989; SCID; Malik & Lindahl, 1997).

Thus, we needed a coding system large enough to pick up all verbal and nonverbal cues that could express both positivity and negativity in interaction, but small enough to facilitate quick and efficient quantitative coding. Therefore, we created and used the following coding system, inspired by the above-mentioned coding schemes' structures, cues and strengths (see Kerig & Baucom, 2004). Importantly we sought to have a comparable scheme for verbal and nonverbal behaviors to fairly compare them.

Our coding system was based on codes of *Negativity* and *Positivity*. Firstly, *Negativity* was made of three subcategories (*hostility*, *withdrawal*, *dysphoric affect*). Verbal *hostility* corresponded to all strong destructive processes and statements expressing hostility or psychological abuse; while nonverbal *hostility* referred to angry and intimidating gestures (e.g., louder voice, threatening voice tone, frowning, brutal movements, intense gazes, etc.). *Withdrawal* was defined by passive (e.g., deny responsibility, minimizing, etc.) or active verbal distance (e.g., disengaging, stonewalling, postponing, etc.); as well as physical distance (e.g., sighs, detached voice tone, closed-body, adaptors, leaning backward, etc.). *Dysphoric affect* transcribed unconstructive and negative actual emotional statements person-centered (e.g., depressive complaints, self-derogatory, self-pity, etc.); and corresponding depressive nonverbal attitudes (e.g., whiny voice, desperate glances, adaptors, tensed body, etc.). Secondly, *Positivity* was composed of two subcategories (*openness*, *humor/positive affect*). *Openness* characterized constructive verbal behavior expressing openness to the partner's viewpoint (e.g., acceptance, intimacy, active listening, etc.), to an active communication

(e.g., accepting responsibility, elaborating, initiating, etc.), or to self-disclosure (e.g., feelings, whishes, etc.); and nonverbal cues expressing inclusion (e.g., soft voice tone, smiles, gazes, head nods, leaning forward, opened-body, etc.). *Humor/positive affect* referred to all statements clearly intended to be humorous and/or positive (e.g., jokes, irony, verbalized positive affect, etc.); and playful attitudes (e.g., laughs, wide smiles, enthusiastic tone voice, relaxed posture, etc.). Finally, verbal behaviors that were irrelevant to the study (but not exhibited as avoidance or hostility) were considered as neutral and reported as off-topic.

3.2. Coding Strategy

Prior to their task, raters started by an extensive training made of: (a) an exhaustive explanation of the coding task, (b) a thorough presentation of the coding system with practice examples, (c) a homework session to get accustomed to the coding process, and (d) several exercises until they reached a satisfying inter-rater reliability (IRR).

All raters adopted a continuous (rather than categorical) scoring strategy to code the dyadic interactions. Verbal and nonverbal behaviors were coded as a function of occurrence (number of cues per sequence) and magnitude (cues' degree of expression). By doing so, all cues exhibited within a sequence were taken into account, and both negativity and positivity were assessed separately.

Afore score computation, we discarded all sequences for which couple's interaction lasted less than 15sec (e.g., some couples stopped talking before the end of the 7min due to mutual agreement reached and/or boredom), and for which participants' behavior was not appropriate (e.g., going out of the room, talking only to the camera, etc.). Additionally, we removed verbal scores from sequences for which couples' conversation was clearly off-topic (as indicated by both verbal raters and transcribers), but not nonverbal behavior as it may still convey important information. Next, we averaged all raters' coding per sequence, before computing an overall score of verbal and nonverbal behaviors on both positivity and negativity for each participant.

Coan, J. A., & Gottman, J. M. (2007). The specific affect coding system (SPAFF). In J. A. Coan & J. J. B. Allen (Eds.), Handbook of Emotion Elicitation and Assessment. Series in Affective Science (pp. 267–285). New York: Oxford University Press.

Floyd, F. J., & Markman, H. J. (1984). An economical observational measure of couples' communication skill. *Journal of Consulting and Clinical Psychology*, *52*(1), 97–103.

Gottman, J. M. (1979). *Marital interaction: Experimental investigations.* New York: Academic.

Griffin, W. A. (1993). Transitions from negative affect during marital interaction: Husband and wife differences. *Journal of Family Psychology*, *6*(3), 230–244.

Hahlweg, K. & Conrad, M. (1983). *Interactional Coding System (ICS).* Unpublished manuscript, University of California, Los Angeles.

Heavey, C. L., Gill, D. S., & Christensen, A. (1996). *The Couples Interaction Rating System*. Unpublished manuscript. University of California, Los Angeles.

Heyman, R. E., & Vivian, D. (1993). Rapid Marital Interaction Coding System (RMICS). Training manual for coders. *Unpublished manuscript, State University of New York, Stony Brook. (Available at http://www.psy.sunysb.edu/marital)*.

Julien, D., Markman, H. J., & Lindahl, K. M. (1989). A comparison of global and microanalytic coding systems: Implications for future trends in studying interactions. *Behavioral Assessment, 11,* 81-100.

Kerig, P. K., & Baucom, D. H. (Eds.). (2004). *Couple Observational Coding Systems*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Krokoff, L. J., Gottman, J. M., & Hass, S. D. (1989). Validation of a global rapid couples interaction scoring system. *Behavioral Assessment, 11,* 65-79.

Malik, N. M., & Lindahl, K. M. (1997). *System for Coding Interactions in Dyads (SCID).* Unpublished manual, University of Miami, Coral Gables, FL.

Olson, D. H., & Ryder, R. G. (1975). *Marital and Family Interaction Coding System (MFICS).* Unpublished manuscript, University of Minnesota, Minneapolis.

Raush, H. L., Barry, W. A., Hertel, R. K., & Swain, M. A. (1974). *Communication, conflict, and marriage*. San Francisco: Jossey-Bass.

3.3. Verbal Coding Structure: Negativity

Verbal Coding Structure: Negativity		
Subcategory	**Cues**	**Examples**
Hostility		
Hostile/Domination	Sarcastic humor, anger, blame, antagonism, contempt, actively unsupportive, verbal irritation, hostile questioning or teasing, belligerence (aggressive), threatening, destructive criticism, interruptions, frustration, faulting, forcing changes, commanding, leading questions (single-oriented answer)	"Just stop complaining, figure it out!" "You must change, that's all!"
Psychological abuse	Verbal disgust, mocking, put down, domineering, devaluing, "gaslighting" (e.g., distort other's memories), insults	"You make me sick!" "You're stupid!"
Destructive processes	Strong deny/refusal/disagree, answering by questions, mind read negative, intentional or internal attributions for negative events but external or unintentional attributions for positive ones, gathering different topics	"You're only being nice so that I'll have sex with you tonight" "No you're wrong!"
Withdrawal		
Passive distance	Reject, off topics (voluntary), no response, disengage, postpone, not supportive when needed, topic shifting/avoidance, failure to comply, stonewalling, weariness	"Hmmm.. Sure ... you're right..." "Let's talk about this later"
Active avoidance	Deny responsibility/minimizing, justifying, asking for factual information, "yes-butting", refusal, semantic or process focus, abstractness, illogic, confusing, defensiveness	"Come on, I don't do it so often" "Yes but if you wouldn't be so maniac though"
Dysphoric affect	Person-centered, actual and negative emotional states (not related to the conflict), such as: Depressive complaints, self-derogatory attributions, strong sad/anxious statements, despondency, self-pity	"We can afford this because I am too stupid to get a good job" "I am an asshole, I've always been.."

3.4. Verbal Coding Structure: Positivity

Verbal Coding Structure: Positivity		
Subcategory	**Cues**	**Examples**
Openness		
To the partner	Paraphrasing, reflecting feelings, positive feedback, expressing caring, concern, comforting, consoling, approving, supporting (active & constructive by giving advices and/or resources), recognition, thanks, complying, using nicknames, gratitude, empathy, compliments	"Yes, that is right." "I like how you have been handling the kids"
To the conversation	Accepting responsibility, agreement or elaborated disagreement, mind read positive, forgiveness, precise topics, problem description, initiation of mutual consideration of solutions, upcoming efforts, sacrifices (expressed in a positive and constructive way), promoting commonalities, compromise, opinion probe, clarification of requests, active communication, validation	"We should start saving money" "You're short with me because you've had a hard day"
Self-disclosure	Personal feelings (positive or negative, but in a constructive way for the conversation), love, desire, devotement, pasts secrets, wishes or beliefs, trust in partner	"I've always wanted to…" "I feel bad or even depressed when you act such a way"
Humor/ Positive Affect	Statements intended to be positive and/or humorous, such as: Jokes, irony (if not hostile), verbalizing positive affect, enthusiasm	"Let's shave our heads and sell flowers at the airport for extra income" "I am very happy when…"

3.5. Nonverbal Coding Structure

Nonverbal Coding Structure	
Subcategory	**Cues**
Negativity	
Hostility	Louder voice and faster rhythm (anger, irritation); slow and cold tone when speaking between teeth (threatening) Gazing at the partner when talking (intimidating, glowering), and looking at something else or rolling eyes Frowning, pouting, or expression of disgust or contempt Quick movements with hostile expressions, pointing, leaning brutally forward, adaptors (anger movements as moving leg), tense body, shaking head Laughing at the partner in order to put down, sneering
Withdrawal	Slow voice rhythm, condescending or detached voice tone, sighs Avoiding eye contact, or few gazes, rolling eyes Passive listening, few feedbacks (head nods, checks, boredom) Physical distance, rigidity, not facing the partner, leaning backward, closed-body (crossed arms, hands, legs, arms akimbo), adaptors of embarrassment (re-seating, tensed), no emotional expression Doing something else while the partner is talking
Dysphoric affect	Low whiny and sad tone of voice, with few loud pitch, desperate sighs, cries Glances, desperate look, looking down Sadness (drooping upper eyelids, pulling down lip corners, frowning) or forced smiles (no eye movement) Adaptors (compulsive/anxious gestures: touching cloths, moving leg, rubbing hands, tapping fingers, biting nails) Tensed body and facial expression, stiff posture or crunched back (submissive posture)
Positivity	
Openness	Slower rhythm, less loud, warm/soft tone (pleasant) or neutral tone, baby talk (tiny voice), with soft hand gesture Energetic and quick voice rhythm, with smiles and expressive arms gestures Looking at the partner in the eyes, head nods and provide feedback, mimicry Opened-body, reducing interpersonal distance, face-to-face posture, leaning forward, physical touch
Humor / Positive Affect	Fast and loud tone of voice in an enthusiastic conversation Relaxed posture (fluid, not tensed), playful attitude, Smiles (Duchene) and laughs

4. Bland-Altman Plots for IRR

The Bland-Altman plot (Bland & Altman, 1986) is a statistical technique used to evaluate the agreement among two different instruments or measurements by plotting their difference against their mean. Bland-Altman plots allow confidence in agreement between two raters if most of the observations remain within the 95% confidence interval lines (± 2SD).

This statistical technique remains one of the most cited papers of all time (Van Noorden, Maher, & Nuzzo, 2014), and stands out as a supporting method of assessing inter-rater reliability (IRR) in addition to the ICC (Rankin, & Stokes, 1998). In fact, isolated ICC indexes do not provide any information regarding the disagreement's magnitude, and may mislead one's interpretation because of oversimplified data representation and sensibility to between-subject variance. Thus, while it is not common practice to rely on data plotting in social psychology research, Bland-Altman plots offer a powerful and required visual representation of (dis)agreements and biases for IRR analysis.

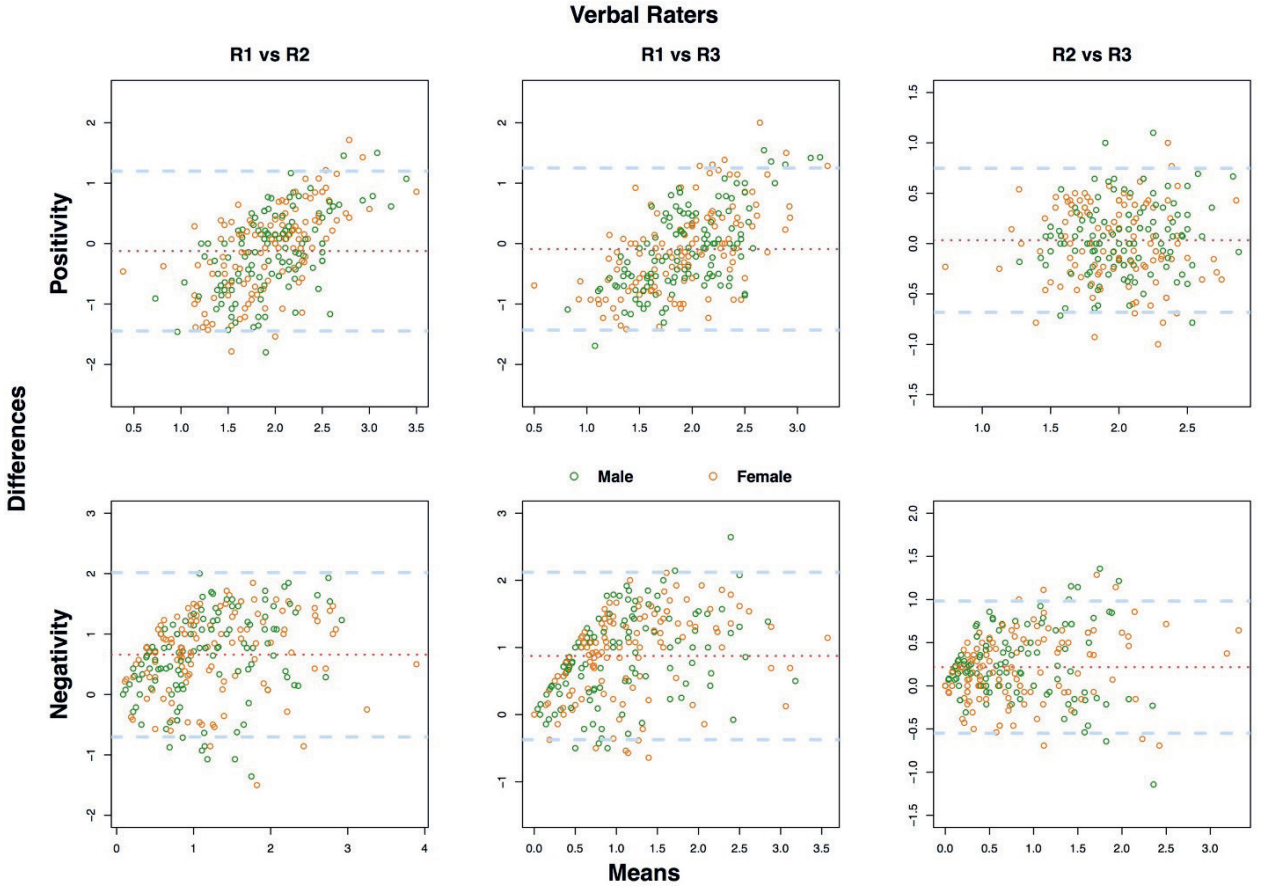
Bland, J. M., & Altman, D. G. (1986). Statistical Methods for Assessing Agreement Between Two Methods of Clinical Measurement. *The Lancet*, *327*(8476), 307–310.

Rankin, G., & Stokes, M. (1998). Reliability of assessment tools in rehabilitation: an illustration of appropriate statistical analyses. *Clinical Rehabilitation*, *12*(3), 187–199.

Van Noorden, R., Maher, B., & Nuzzo, R. (2014). The top 100 papers. *Nature*, *514*(7524), 550–553.

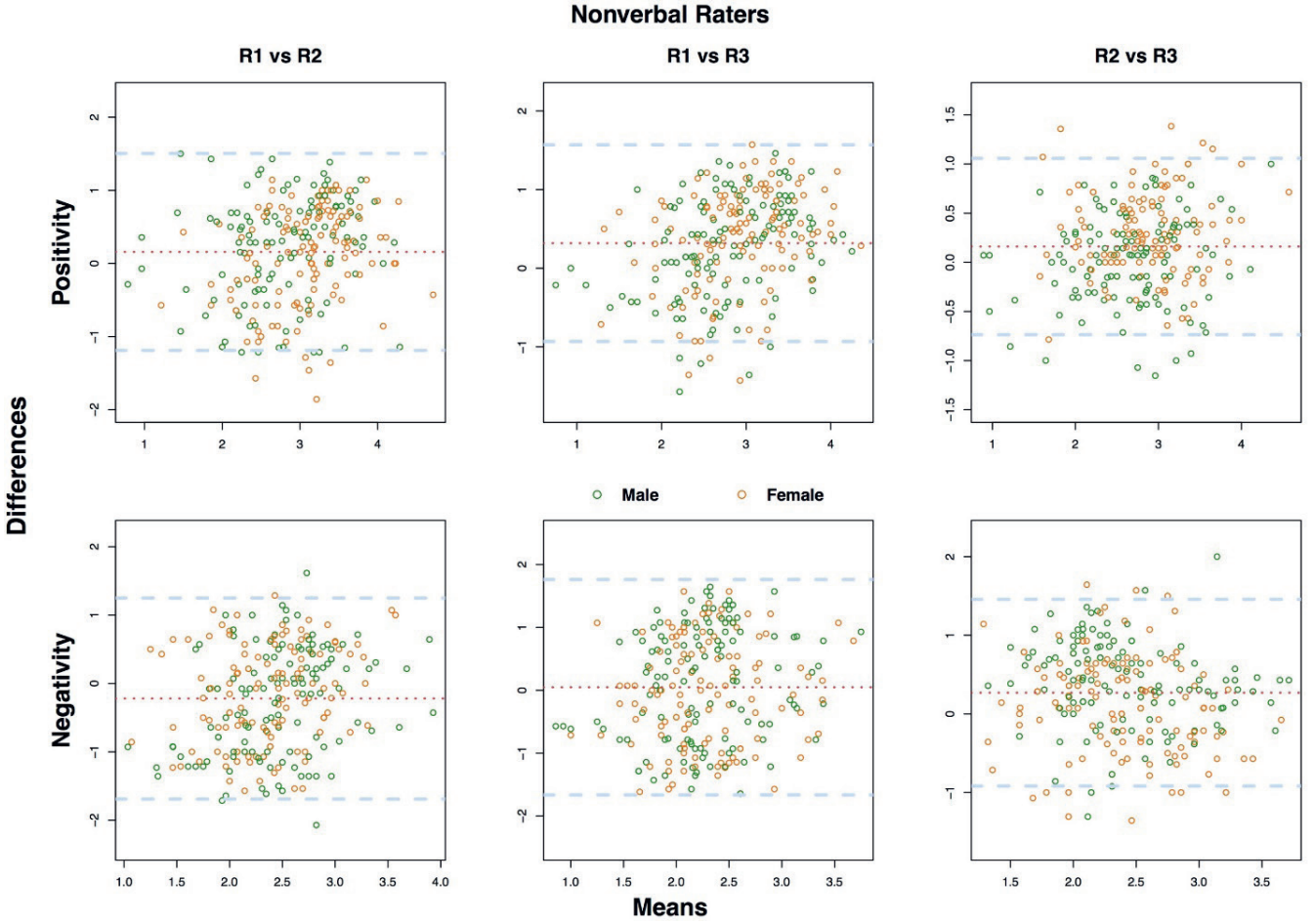
4.1. Verbal Raters

Fig. S1. Bland-Altman plots for verbal raters. Two by two comparisons of three raters' coding per participant's gender, for both verbal positivity (upper plots) and negativity (lower plots). For each plot, difference among raters (*y*-axis) is plotted against their mean (*x*-axis). Red dotted line represents the mean of differences. Blue broken lines depict the 95% confidence intervals on the limits of agreement.



4.2. Nonverbal Raters

Fig. S2. Bland-Altman plots for nonverbal raters. Two by two comparisons of three raters' coding per participant's gender, for both nonverbal positivity (upper plots) and negativity (lower plots). For each plot, difference among raters (*y*-axis) is plotted against their mean (*x*-axis). Red dotted line represents the mean of differences. Blue broken lines depict the 95% confidence intervals on the limits of agreement.



5. Ancillary Analyses

Table S1. Multilevel Regression Analyses on Behaviors' Positivity and Negativity

	Predictor									
	Implicit partner evaluations					Explicit relationship evaluation				
Outcome	***b***	***SE***	***95% CI***	***p***	**β**	***b***	***SE***	***95% CI***	***p***	**β**
NVB Positivity	0.30	0.07	[0.15, 0.44]	< .001	0.16	0.03	0.04	[-0.04, 0.11]	.349	0.05
NVB Negativity	-0.09	0.08	[-0.25, 0.07]	.252	-.007	-0.02	0.03	[-0.09, 0.04]	.474	-0.05
VB Positivity	-0.03	0.07	[-0.18, 0.11]	.639	-0.03	-0.02	0.03	[-0.08, 0.04]	.463	-0.05
VB Negativity	0.03	0.10	[-0.17, 0.22]	.799	0.01	-0.02	0.04	[-0.11, 0.07]	.652	-0.03

Note. NVB = nonverbal behavior; VB = verbal behavior; CI = confidence interval.

Table S2. Results of Multilevel Mediation Models for IPE's Effects on Relational Outcomes through NVB Positivity

	Individual's parameters					Controlling for baseline satisfaction				
Model	***b***	***SE***	**95% CI**	***p***	**β**	***b***	***SE***	**95% CI**	***p***	**β**
Satisfaction with conversation solution										
NVB Positivity	0.35	0.18	[0.002, 0.697]	.049	0.14	0.33	0.18	[-0.01, 0.68]	.058	0.13
IPE										
Total effect	-0.34	0.23	[-0.80, 0.12]	.145	-0.07	-0.37	0.23	[-0.83, 0.09]	.113	-0.08
Direct effect	-0.44	0.24	[-0.91, 0.04]	.071	-0.10	-0.47	0.24	[-0.94, 0.01]	.053	-0.10
Indirect effect	0.10		[0.002, 0.178]			0.10		[-0.03, 0.15]		
Relationship satisfaction after conversation										
NVB Positivity	0.15	0.08	[-0.01, 0.31]	.062	0.14	0.13	0.07	[-0.01, 0.26]	.073	0.11
IPE										
Total effect	0.15	0.12	[-0.08, 0.38]	.211	0.07	0.10	0.11	[-0.12, 0.32]	.355	0.05
Direct effect	0.11	0.12	[-0.12, 0.35]	.344	0.06	0.07	0.11	[-0.15, 0.30]	.519	0.04
Indirect effect	0.04		[-0.001, 0.094]			0.04		[-0.004, 0.082]		
Relationship satisfaction Diary										
NVB Positivity	0.17	0.09	[-0.01, 0.35]	.069	0.10	0.14	0.08	[-0.02, 0.31]	.082	0.08
IPE										
Total effect	0.33	0.12	[0.09, 0.56]	.006	0.11	0.33	0.12	[0.10, 0.56]	.005	0.11
Direct effect	0.29	0.12	[0.05, 0.54]	.017	0.10	0.30	0.12	[0.07, 0.54]	.012	0.10
Indirect effect	0.05		[-0.004, 0.104]			0.04		[-0.01, 0.09]		

Note. Predictors' parameters for each of the three levels of relational satisfaction, with and without controlling for baseline relationship satisfaction. IPE = implicit partner evaluations; NVB = nonverbal behavior; CI = confidence interval.

Table S3. Results of Multilevel Mediation Models for IPE's Effects on Partner's Relational Outcomes through NVB

	Individual's parameters					Controlling for partner's baseline satisfaction				
Model	***b***	***SE***	**95% CI**	***p***	**β**	***b***	***SE***	**95% CI**	***p***	**β**
Partner's Satisfaction with conversation solution										
NVB	0.25	0.12	[0.02, 0.48]	.033	0.14	0.23	0.12	[-0.001, 0.46]	.051	0.13
IPE										
Total effect	0.22	0.23	[-0.24, 0.68]	.353	0.05	0.22	0.23	[-0.24, 0.68]	.351	0.05
Direct effect	0.13	0.24	[-0.34, 0.61]	.585	0.03	0.15	0.24	[-0.33, 0.62]	.545	0.03
Indirect effect	0.08		[0.01, 0.18]			0.08		[-0.002, 0.166]		
Partner's Relationship satisfaction after conversation										
NVB	0.13	0.05	[0.02, 0.23]	.017	0.17	0.09	0.05	[-0.002, 0.183]	.054	0.12
IPE										
Total effect	-0.08	0.12	[-0.31, 0.15]	.508	-0.04	-0.10	0.11	[-0.32, 0.12]	.370	-0.05
Direct effect	-0.12	0.12	[-0.36, 0.12]	.314	-0.06	-0.12	0.11	[-0.34, 0.10]	.280	-0.06
Indirect effect	0.04		[0.01, 0.10]			0.03		[-0.001, 0.074]		
Partner's Relationship satisfaction Diary										
NVB	0.07	0.06	[-0.05, 0.20]	.246	0.06	0.05	0.06	[-0.06, 0.16]	.330	0.05
IPE										
Total effect	-0.11	0.12	[-0.35, 0.12]	.353	-0.04	-0.10	0.12	[-0.33, 0.13]	.384	-0.03
Direct effect	-0.15	0.12	[-0.40, 0.09]	.222	-0.05	-0.13	0.12	[-0.36, 0.11]	.293	-0.04
Indirect effect	0.02		[-0.02, 0.07]			0.02		[-0.02, 0.06]		

Note. Predictors' parameters for each of the three levels of relational satisfaction, with and without controlling for baseline relationship satisfaction. IPE = implicit partner evaluations; NVB = nonverbal behavior; CI = confidence interval.

Table S4. Results of Multilevel Mediation Models for IPE's Effects on Partner's Relational Outcomes through NVB Positivity

	Individual's parameters					Controlling for partner's baseline satisfaction				
Model	***b***	***SE***	**95% CI**	***p***	**β**	***b***	***SE***	**95% CI**	***p***	**β**
Partner's Satisfaction with conversation solution										
NVB Positivity	0.28	0.18	[-0.07, 0.63]	.119	0.11	0.25	0.18	[-0.09, 0.60]	.152	0.10
IPE										
Total effect	0.22	0.23	[-0.24, 0.68]	.353	0.05	0.22	0.23	[-0.24, 0.68]	.351	0.05
Direct effect	0.15	0.24	[-0.33, 0.62]	.542	0.03	0.16	0.24	[-0.31, 0.64]	.502	0.04
Indirect effect	0.08		[-0.03, 0.16]			0.07		[-0.04, 0.15]		
Partner's Relationship satisfaction after conversation										
NVB Positivity	0.17	0.08	[0.01, 0.32]	.041	0.15	0.13	0.07	[-0.01, 0.26]	.069	0.11
IPE										
Total effect	-0.08	0.12	[-0.31, 0.15]	.508	-0.04	-0.10	0.11	[-0.32, 0.12]	.370	-0.05
Direct effect	-0.12	0.12	[-0.35, 0.12]	.324	-0.06	-0.12	0.11	[-0.34, 0.10]	.291	-0.06
Indirect effect	0.05		[0.002, 0.102]			0.04		[-0.002, 0.087]		
Partner's Relationship satisfaction Diary										
NVB Positivity	0.08	0.10	[-0.11, 0.27]	.395	0.05	0.06	0.08	[-0.11, 0.23]	.478	0.04
IPE										
Total effect	-0.11	0.12	[-0.35, 0.12]	.353	-0.04	-0.10	0.12	[-0.33, 0.13]	.384	-0.03
Direct effect	-0.15	0.12	[-0.40, 0.09]	.228	-0.05	-0.12	0.12	[-0.36, 0.11]	.306	-0.04
Indirect effect	0.02		[-0.04, 0.07]			0.02		[-0.04, 0.06]		

Note: Predictors' parameters for each of the three levels of relational satisfaction, with and without controlling for baseline relationship satisfaction. IPE = implicit partner evaluations; NVB = nonverbal behavior; CI = confidence interval.

SUPPLEMENTAL MATERIAL FOR CHAPTER 4

STUDY 1

1. Single Category Implicit Association Test (SC-IAT)

To assess implicit partner evaluations, we used the same Single Category Implicit Association Test (SC-IAT; Karpinski & Steinman, 2006). This test run on a desk computer with Inquisit 4 Lab (Millisecond, 2015). The script was retrieved and adjusted from the Millisecond library (https://www.millisecond.com/download/library/iat/sc_iat/).

This computer-based behavioral test is a valid and reliable tool that is particularly suited to measure the magnitude of the mental associations towards a single attitude object (i.e., a romantic partner) for which there is no reference category to compare it to (Faure et al., 2018; Karpinski, 2004; Karpinski & Steinman, 2006). In both studies, participants were instructed to indicate whether the target words sequentially presented on the screen belonged to a category that was located on the top left (key response "E") or right corner of the screen (key response "I"), as quickly and correctly as possible (errors were followed by a red cross). Target words could either be categorized as *Positive* (21 items), *Negative* (21 items), or *Partner*-related (3 items; the close other's first name, last name, and nickname (or alternatively, the partner's initials), all provided by the participant before the task). Following Karpinski and Steinman's (2006) procedure, participants performed two different blocks of 96 trials each (24 first items were practice trials). In one block, the category *Partner* was paired with *Positive* on the same side of the screen (compatible block), while in another block (incompatible block), the categories *Partner* and *Negative* were coupled together (presentation order was counterbalanced between participants). In each block, target words were presented using a 7:7:10 ratio so that 58% of correct responses were on one response-key (e.g., *Positive* and *Partner* words in the compatible block) and the other 42% were on the other response-key (e.g., *Negative* words in the compatible block).

We computed SC-IAT scores according to standard scoring algorithms (Greenwald et al., 2003; Karpinski & Steinman, 2006; Wentura & Degner, 2010): Practice trials were eliminated, responses below 350ms or above 3,000ms were discarded, and error responses were replaced by the block mean of the participant to which we added a 400ms penalty. Next, the averaged response times in the compatible block were subtracted from those in the incompatible block, and then divided by within-individual's standard deviation of all correct response times. Thus, higher scores represent more positive implicit partner evaluations, as reflected by faster reaction times in the compatible block than in the incompatible. Importantly, given that participants categorize the same (number of) target words in both blocks (i.e., positive, negative, partner), any difference in reaction times (RTs) between these two blocks can only be due to the pairings, and not to the specific words or to the categories. Put otherwise, because SC-IAT scores include reaction times to all target words for both types of pairings, not only do SC-IAT scores control for any implicit tendency toward positivity and/or negativity, but they also reinforce the idea that implicit

partner evaluations are not driven by, or a reflection of, more global implicit reactions (else, SC-IAT scores would simply be 0).

In Study 1, participants held relatively positive implicit evaluations of their close other (M = 0.20, SD = 0.30), as revealed by a one-sample t-test against 0, $t(130) = 7.61$, 95% CI = [0.15 , 0.25], $p < .001$, $d = 0.67$. More specifically, an independent t-test indicated that participants who used their romantic partner as close other had significantly more positive implicit evaluations (M = 0.27, SD = 0.32) than those who used a non-romantic partner (M = 0.14, SD = 0.27), $t(129) = 2.58$, 95% CI = [0.03, 0.24], $p = .011$, $d = 0.45$.

Table S1. Organization SC-IAT

Block	Trials	Function	Left-key response	Right-key response
1_a	24	Practice	Positive words + Partner words[1]	Negative words
2_a	72	Test	Positive words + Partner words[1]	Negative words
3_b	24	Practice	Positive words	Negative words + Partner words[1]
4_b	72	Test	Positive words	Negative words + Partner words[1]

Note. Blocks with a common subscript were experienced as one continuous block.
[1] In Study 1, these were either partner or close other stimuli.

Table S2. Target Words Used in the SC-IAT

Original English target words		Dutch translation	
Positive	**Negative**	**Positief**	**Negatief**
Beautiful	Angry	Mooi	Boos
Celebrating	Brutal	Vieren	Wreed
Cheerful	Destroy	Blijdschap	Vernietigen
Excellent	Dirty	Uitstekend	Vies
Excitement	Disaster	Opwinding	Ramp
Fabulous	Disgusting	Fantastisch	Walgelijk
Friendly	Dislike	Vriendelijk	Afkeer
Glad	Evil	Verheugd	Kwaadaardig
Glee [a]	Gross	Gelukkig	Onbeschoft
Happy	Horrible	Blij	Verschrikkelijk [c]
Laughing	Humiliate	Lachen	Vernederen
Likeable	Nasty	Aardig	Smerig [c]
Loving	Noxious	Lief	Schadelijk
Marvelous	Painful	Wonderbaarlijk	Pijnlijk
Pleasure	Revolting	Plezier	Weerzinwekkend
Smiling	Sickening [b]	Glimlachen	Smerig [c]
Splendid	Terrible	Schitterend	Verschrikkelijk [c]
Superb	Tragic	Geweldig	Tragisch
Paradise	Ugly	Paradijs	Lelijk
Triumph	Unpleasant	Overwinning	Onaangenaam
Wonderful	Yucky	Prachtig	Bah

Note. Dutch-translated target words by category (attribute words were the partner's first name, last name, and nickname/initials). A few translations have been adjusted to match the Dutch language. SC-IAT = Single Category Implicit Association Test. [a] Translation closer to "Lucky". [b] Translation closer to "Filthy". [c] Translations repeated twice due to overlap in meanings.

2. Scales

Relationship status

- Wat is je relatiestatus? ("single" vs. "in een relatie")

- What is your relationship status? ("single" vs. "in a relationship")

Brief Self-Control Scale (Tangney, Baumeister, & Boone, 2004; 1 = do not agree at all; 7 = agree completely)

1. Ik vind het moeilijk om slechte gewoonten te doorbreken
2. Ik ben lui
3. Ik vind het moeilijk om nee te zeggen
4. Ik verander vrij vaak van gedachten
5. Ik wou dat ik meer zelfdiscipline had
6. Ik kan goed weerstand bieden aan verleidingen
7. Ik laat me meeslepen door mijn emoties
8. Ik ben niet snel ontmoedigd
9. Ik heb moeite om me te concentreren
10. Ik kan efficiënt naar lange termijn doelen toewerken
11. Soms kan ik het niet laten dingen te doen die eigenlijk slecht voor me zijn

1. I have a hard time breaking bad habits
2. I am lazy
3. I find it difficult to say no
4. I change my mind quite often
5. I wish I had more self-discipline
6. I am good at resisting temptation
7. I get carried away by my emotions
8. I am not easily discouraged
9. I have trouble concentrating
10. I am able to work effectively toward long-term goals
11. Sometimes I can't stop myself from doing something, even if I know it is wrong

Brief Aggression Questionnaire (BAQ; Webster, DeWall, Pond, Deckman, Jonason, & Le, 2014; 1 = extremely uncharacteristic of me; 7 = extremely characteristic of me)

1. Ik zeg het mijn vrienden openlijk als ik het niet met ze eens ben
2. Als ik genoeg geprovoceerd wordt, kan het zijn dat ik iemand zal slaan
3. Als ik me erger aan mensen, zeg ik wat ik van ze vind
4. Ik ben een goedgehumeurd person
5. Als ik geweld moet gebruiken om voor mijn rechten op te komen, dan doe ik dat

6. Ik ben wel eens zo uitgedaagd door iemand, dat het uitliep op een gevecht
7. Het kost me moeite mijn zelfbeheersing te bewaren
8. Wanneer iemand bijzonder aardig doet vraag ik me af wat ze willen
9. Mijn vrienden vinden me ruziezoekend
10. Soms schiet ik, zonder aanleiding, uit mijn slof
11. Ik heb het gevoel dat mensen me soms achter mijn rug om uitlachen
12. Het lijkt alsof anderen altijd geluk hebben

1. I tell my friends openly when I disagree with them
2. Given enough provocation, I may hit another person.
3. When people annoy me, I may tell them what I think of them
4. I am an even-tempered person
5. If I have to resort to violence to protect my rights, I will
6. There are people who pushed me so far that we came to blows
7. I have trouble controlling my temper
8. When people are especially nice, I wonder what they want
9. My friends say that I'm somewhat argumentative
10. Sometimes I fly off the handle for no good reason
11. I sometimes feel that people are laughing at me behind my back
12. Other people always seem to get the breaks

Explicit Partner Evaluations (EPE; 1 = do not agree at all; 7 = agree completely)

1. Ik vind [Partner] erg leuk
2. Ik voel veel positieve affectie voor [Partner]
3. Ik waardeer [Partner]
4. Ik houd van [Partner]
5. [Partner] is een waardevol

1. I like [Partner] very much
2. I feel a lot of positive affect towards [Partner]
3. I esteem [Partner] very much
4. I love [Partner]
5. [Partner] is a very valuable person

Transgression-Related Interpersonal Motivations Inventory (TRIM-18; McCullough, Root, & Cohen, 2006; 1 = do not agree at all; 7 = agree completely) including Avoidance (A), Benevolence (B) and Revenge (R) Motivations

1. Ik zal het [Partner] betaald zetten
2. Ik wil zoveel mogelijk afstand tussen mij en [Partner]
3. Ondanks de pijn die [Partner] me doet, blijf ik goedhartig naar [Partner]
4. Ik wens dat [Partner] iets slechts zal overkomen

5. Ik wil verder leven alsof [Partner] niet meer bestaat
6. Ik wil de strijdbijl neerleggen en verdergaan met de relatie die [Partner] en ik hiervoor hadden
7. Ik vertrouw [Partner] nu niet meer
8. Ondanks de acties van [Partner] wil ik graag een fijne relatie met [hem/haar] voortzetten
9. Ik wil dat [Partner] krijgt wat [hij/zij] verdient
10. Ik vind het moeilijk om me warm en hartelijk te gedragen naar [Partner] toe
11. Ik ontwijk [Partner]
12. De pijn die [Partner] me gedaan heeft zet ik opzij om onze relatie voort te kunnen zetten
13. Ik ga het goedmaken met [Partner]
14. Ik zet mijn verontwaardiging aan de kant
15. Ik heb de relatie tussen mij en [Partner] verbroken
16. Ik heb mijn boosheid losgelaten om verder te kunnen met de relatie die we hebben
17. Ik wil zien dat [Partner] ook pijn gedaan wordt
18. Ik trek me terug van [Partner]

1. I'll make [Partner] pay (R)
2. I am trying to keep as much distance between me and [Partner] as possible (A)
3. Even though [Partner]'s actions hurt me, I have goodwill for [Partner] (B)
4. I wish that something bad would happen to [Partner] (R)
5. I am living as if [Partner] doesn't exist, isn't around (A)
6. I want us to bury the hatchet and move forward with the relationship I have with [Partner] (B)
7. I don't trust [Partner] (A)
8. Despite what [Partner] did, I want us to have a positive relationship again (B)
9. I want [Partner] to get what [he/she] deserves (R)
10. I am finding it difficult to act warmly toward [Partner] (A)
11. I am avoiding [Partner] (A)
12. Although [Partner] hurt me, I am putting the hurts aside so we can resume our relationship (B)
13. I'm going to get even (R)
14. I have given up my hurt and resentment (B)
15. I cut off the relationship with [Partner] (A)
16. I have released my anger so I can work on restoring our relationship to health (B)
17. I want to see [Partner] hurt and miserable (R)
18. I withdraw from [Partner] (A)

3. Experimental Manipulation

Following Schmeichel, Vohs, & Baumeister's procedure (2003), participants were asked to watch a short videotape with no sound, which was introduced as an experiment on nonverbal assessments of personality. This 7-min video was a recording of a woman being interviewed by an off-camera interviewer. The camera was placed behind the interviewer, and thus only the woman was visible. Participants were instructed to pay close attention to this video clip because by the end of the task they would be asked to make person-perception judgments about the personality of the interviewee based on what they saw. During the video, a series of common one-syllable words (e.g., *straw*) were sequentially displayed in the bottom right corner of the screen for 30sec each. Though readily apparent (printed in black on a white background), these words did not dominate the main area of screen and had no relationship with the videotape nor with the interviewee.

Crucially, half of the participants were asked to focus exclusively on the interviewee and not to read nor to look at any words that may appear on the screen, and to redirect their attention to the woman if they found themselves looking at the words (experimental condition, $n = 65$); while the other half were not given any instructions, nor made aware of the irrelevant words (control condition, $n = 66$). In fact, asking participants to consciously manage their attention is what lowers their executive control (see Schmeichel et al., 2003) and using such video-watching attention control manipulations have been found to produce medium and robust effect sizes ($d = 0.61$; Hagger et al., 2010). Supporting our experimental manipulation, a chi-square test of independence indicated that participants in the experimental condition paid more attention to the videotape (i.e., they were more likely to report watching the entire video from beginning to end) than those in the control condition, c^2 (1, $N = 131$) = 8.28, $p = .004$, $\varphi = 0.25$.

Link to video: https://www.youtube.com/watch?v=EDudVLkXk_4

Manipulation check (0 = *I have skipped some parts of the video or done something else*; 1 = *I watched the entire video from beginning to end)*

- Het antwoord op de volgende vraag heeft geen invloed op de uitbetaling van je deelname (we betalen je hoe dan ook), maar het is belangrijk voor de resultaten van het onderzoek of we je data kunnen gebruiken. Heb je de gehele video van begin tot eind gekeken, heb je sommige delen van de video overgeslagen of heb je iets anders gedaan (in plaats van de hele video te kijken)?

- The answer to the next question does not affect your payment for participation (we will pay you anyway), but it is important for the results of the research whether we can use your data. Did you watch the entire video from beginning to end, did you skip some parts of the video, or did you do something different (instead of watching the whole video)?

4. Transgression Scenario

Since participants were relatively young students for the most part, the following scenario was specifically developed to ensure that they could easily relate to it (see below). To faciliate imagination, the close other's name was inserted in-text and pronouns were matched accordingly. To ensure that the participants identified with the scenario, a significant emphasis was given on how important the celebration was to the participant.

"Imagine the following situation: You have your graduation party tomorrow night. After all the courses, exams, and papers you finally managed to get your degree. As happy and proud as your family is, they all decide that this is an important day that should be celebrated. After your graduation, you and your family will be going out for dinner, and afterwards there will be a big party. As [Name] is a very important person to you, you really want [her/him] to be part of the festivities. [S/he] has guaranteed to you that [s/he] will be there, but at the last moment [s/he] is offered a ticket for a concert of [her/his] favorite band which will perform for the first time in the Netherlands. [S/he] tells you that [s/he] wants to go to the concert rather than attend your graduation party. You tell [her/him] that you really want [her/him] to be there for you for such an important event in your life. Finally, on the day of the graduation party, [Name] does not show up and you know that [s/he] is at the concert."

"Stel je de volgende situatie voor: Morgenavond is je diploma-uitreiking want na jaren studie-stress door veel vakken te volgen, examens te maken en papers te schrijven is het je eindelijk gelukt je diploma te halen. Zo trots als je familie op je is, hebben ze besloten dat deze fantastische prestatie meteen gevierd moet worden. Na de diploma-uitreiking zullen jij, je familie en vrienden eerst uiteten gaan, wat gevolgd zal worden door een groot afstudeerfeest. Aangezien [Name] erg veel voor je betekent, wil je heel graag dat [zij/hij] erbij is. [Name] heeft je natuurlijk gegarandeerd dat [zij/hij] erbij zal zijn, want ook [zij/hij] weet hoe belangrijk dit voor je is. Op het laatste moment krijgt [Name] echter een kaartje aangeboden voor het concert van haar/zijn favoriete band die voor de allereerste keer hier in Nederland zal optreden. [Name] vertelt je dat [zij/hij] liever naar het concert gaat dan naar jouw afstudeer diner en feest. Jij vertelt op jouw beurt dat je haar/hem echt heel graag erbij wilt hebben omdat het zo'n belangrijke gebeurtenis in je leven is. Op je afstudeerdiner en feest is [Name] er niet bij en je weet zeker dat [zij/hij] op het concert is."

Situation check

- Geef op een schaal van 1 (helemaal niet) tot 7 (helemaal wel) aan in hoeverre het je gelukt is om je in te beelden in de geschetste situatie.

- To what extent did you manage to picture yourself in the outlined situation? (1 = "not at all" and 7 = "very much")

A one-sample *t*-test against 4 (i.e., the middle of the scale) revealed that participants successfully pictured themselves in the transgression scenario ($M = 4.89$, $SD = 1.55$), $t(130) = 6.55$, 95% CI = [4.62 , 5.15], $p < .001$, $d = 0.57$.

Additionally, we pilot-tested the credibility of this scenario among 199 participants (123 females, $M_{age} = 24.85$ years, $SD_{age} = 8.31$). All participants were involved in a romantic relationship for at least 4 months ($M = 47.78$ months, $SD = 77.02$) and were drawn from the same pool of subjects as those in Study 1. Participants were asked to read the same scenario as the one used in Study 1 prior to answering two questions using a 7-point Likert scale (1 = *not at all*; 7 = *very much*). First, to ensure that participants really imagined themselves in this situation, we specifically asked them: '*To what extent did you manage to picture yourself in the previous situation? That is, we do not ask you to what extent you believe this situation could happen to you, but rather how much did you manage to imagine yourself in such situation?*'. Second, to examine whether this scenario was indeed interpreted as a transgression, we asked them: '*How much could you feel the 'pain' as if you were in such situation?*'. A series of one-sample *t*-tests against the middle of a 7-point Likert scale (i.e., 4) indicated that participants successfully imagined themselves experiencing this situation ($M = 5.16$, $SD = 1.47$), $t(198) = 11.11$, 95% CI = [4.95, 5.36], $p < .001$, $d = .79$, and significantly felt the pain elicited by the transgression scenario ($M = 4.66$, $SD = 1.51$), $t(198) = 6.22$, 95% CI = [4.45, 4.87], $p < .001$, $d = .44$. Moreover, these two items were strongly correlated with one another, $r(197) = .44$, $p < .001$, suggesting that our single item in Study 1 serves as a reliable proxy to confirm the credibility of our transgression scenario.

5. Secondary Analyses

Although not hypothesized, we examined whether the interaction effect between implicit partner evaluations and our experimental manipulation was possibly driven by a non-linear, quadratic effect of implicit partner evaluations (MacCallum & Mar, 1995). Thus, in a multiple regression model, we regressed forgiveness scores onto implicit partner evaluations scores, a dummy-coded condition variable, their interaction term, and the quadratic term for implicit partner evaluations (i.e., squared implicit partner evaluation scores). As can be seen in Table S1, the quadratic effect of implicit partner evaluations was not significant and controlling for this variable did not affect our results.

Table S3. Secondary Results Controlling for Quadratic Effect (Study 1)

Model	Predictors	β	*SE*	*t*	*df*	*p*	95% CI	R^2
1								.038
	IPE	0.07	0.09	0.79	126	.432	[-0.11, 0.24]	.006
	Condition	0.03	0.18	0.27	126	.792	[-0.30, 0.39]	.001
	IPE*Condition	0.18	0.18	2.00	126	.048	[0.003, 0.698]	.030
	Q(IPE)	-0.02	0.07	-0.27	126	.791	[-0.15, 0.11]	.001

Note. Results from of a multiple linear regression model predicting forgiveness (TRIM-18). IPE = implicit partner evaluations (SC-IAT); Condition = experimental group (coded 0.5) vs. control group (coded -0.5); *Q*(IPE) = quadratic effect of implicit partner evaluations. All continuous scores were standardized. We calculated the proportion of variance explained by each predictor using model comparison (change in R^2) as effect size estimates.

STUDY 2

1. Sample

The current sample was part of a larger project (we provide previous publications that used this dataset below for transparency purposes). In line with current recommendations (Finkel et al., 2015), this sample size was defined before data collection, based on our financial and recruitment constraints, and combined with a diary design to provide adequate statistical power. Couples were recruited through various methods (e.g., advertisements, social networks, personal approach). Criteria to participate in the present study were (a) to speak Dutch fluently, (b) to be committed to a romantic partner for at least 4 months, and (c) to be childless. Participants received an 80€ compensation for taking part in the Intake and for answering to no fewer than 80% of the Diary signals. They were told that from the upcoming Saturday following the Intake session, they would receive an email every evening after 9.00 pm, which would contain a link to redirect them to a Qualtrics survey in which they had to report information about that day's experiences. At the end of the study, they were also added to a raffle to win a 200€ bonus.

Participants responded to 90.9% of the 8 daily signals (M = 7.27, SD = 1.33). Given the high level of compliance in the diary phase, all participants were included in our analyses to the extent that they had responded to at least one diary signal. To handle missing data, which were assumed to be missing at random, we used mixed models with the Restricted Maximum Likelihood (REML). In brief, the REML method is especially suited for handling missing values because it only removes the missing observation rather than the entire case (e.g., the missing days and not the participants with one or more missing days) and then uses maximum likelihood to estimate unbiased parameters.

2. List of Previous Publications

The ten following publications referred to the same dataset presented in the current work. However, those articles addressed different research questions that are not central to the hypotheses tested in present investigation and, thus, will not be discussed further.

Faure, R., Righetti, F., Seibel, M., & Hofmann, W. (2018). Speech is Silver, Nonverbal Behavior is Gold: How Implicit Partner Evaluations Affect Dyadic Interactions in Close Relationships. *Psychological Science, 29*(11), 1731–1741. https://doi.org/10.1177/0956797618785899

Righetti, F., Balliet, D., Visserman, M., & Hofmann, W. (2015). Trust and the Suppression of Emotions During Sacrifice in Close Relationships. *Social Cognition*, *33*(5), 505–519. https://doi.org/10.1521/soco.2015.33.5.505

Righetti, F., Gere, J., Hofmann, W., Visserman, M. L., & Van Lange, P. A. M. (2016). The Burden of Empathy: Partners' Responses to Divergence of Interests in Daily Life. *Emotion*. https://doi.org/10.1037/emo0000163

Righetti, F., Luchies, L. B., van Gils, S., Slotter, E. B., Witcher, B., & Kumashiro, M. (2015). The Prosocial Versus Proself Power Holder: How Power Influences Sacrifice in Romantic Relationships. *Personality and Social Psychology Bulletin*, *41*(6), 779–790. https://doi.org/10.1177/0146167215579054

Righetti, F., Schneider, I., Ferrier, D., Spiridonova, T., Xiang, R., & Impett, E. A. (2020). The bittersweet taste of sacrifice: Consequences for ambivalence and mixed reactions. *Journal of Experimental Psychology: General*. Advance online publication. http://dx.doi.org/10.1037/xge0000750

Righetti, F., & Visserman, M. (2017). I Gave Too Much: Low Self-Esteem and the Regret of Sacrifices. *Social Psychological and Personality Science, 9*(4), 453-460. DOI: 10.1177/1948550617707019.

Visserman, M. L., Impett, E. A., Righetti, F., Muise, A., Keltner, D., & Van Lange, P. A. M. (2019). To "See" Is to Feel Grateful? A Quasi-Signal Detection Analysis of Romantic Partners' Sacrifices. *Social Psychological and Personality Science*, *10*(3), 317–325. https://doi.org/10.1177/1948550618757599

Visserman, M. L., Righetti, F., Impett, E. A., Keltner, D., & Van Lange, P. A. M. (2017). It's the Motive That Counts: Perceived Sacrifice Motives and Gratitude in Romantic Relationships. *Emotion*. https://doi.org/10.1037/emo0000344

Visserman, M. L., Righetti, F., Kumashiro, M., & Van Lange, P. A. M. (2017). Me or Us? Self- Control Promotes a Healthy Balance Between Personal and Relationship Concerns. *Social Psychological and Personality Science*, *8*(1), 55–65. https://doi.org/10.1177/1948550616662121

Zoppolat, G., Visserman, M. L., & Righetti, F. (2020). A nice surprise: Sacrifice expectations and partner appreciation in romantic relationships. *Journal of Social and Personal Relationships*, *37*(2), 450-466. https://doi.org/10.1177/0265407519867145

3. Single Category Implicit Association Test (SC-IAT)

To assess implicit partner evaluations, we used the same SC-IAT (Karpinski & Steinman, 2006) as the one described in Study 1. Again, participants held relatively positive implicit evaluations of their romantic partner ($M = 0.21$, $SD = 0.33$), $t(246) = 9.75$, 95% CI = [0.16, 0.25], $p < .001$, $d = 0.62$ (one-sample t-test against 0).

4. Scales

Brief Self-Control Scale (Tangney, Baumeister, & Boone, 2004; 1 = *strongly disagree*, 7 = *strongly agree)*

1. Ik vind het moeilijk om slechte gewoonten te doorbreken
2. Ik ben lui
3. Ik vind het moeilijk om nee te zeggen
4. Ik verander vrij vaak van gedachten
5. Ik wou dat ik meer zelfdiscipline had
6. Ik kan goed weerstand bieden aan verleidingen
7. Ik laat me meeslepen door mijn emoties
8. Ik ben niet snel ontmoedigd
9. Ik heb moeite om me te concentreren
10. Ik kan efficiënt naar lange termijn doelen toewerken
11. Soms kan ik het niet laten dingen te doen die eigenlijk slecht voor me zijn

1. I have a hard time breaking bad habits
2. I am lazy
3. I find it difficult to say no
4. I change my mind quite often
5. I wish I had more self-discipline
6. I am good at resisting temptation
7. I get carried away by my emotions
8. I am not easily discouraged
9. I have trouble concentrating
10. I am able to work effectively toward long-term goals
11. Sometimes I can't stop myself from doing something, even if I know it is wrong

Commitment (7-item Subscale; Rusbult, Martz, & Agnew, 1998; 1 = *strongly disagree*, 7 = *strongly agree)*

5. Ik wil dat onze relatie standhoudt voor een heel lange tijd
6. Ik ben toegewijd aan mijn relatie met mijn partner
7. Ik zou het eigenlijk niet zo heel erg vinden als onze relatie in de nabije toekomst stuk zou lopen

8. Het is waarschijnlijk dat ik in het komende jaar met iemand anders uit zal gaan dan mijn huidige partner
9. Ik ben zeer gehecht aan onze relatie en heel sterk verbonden met mijn partner
10. Ik wil dat onze relatie voor altijd standhoudt
11. I ben gericht op de lange termijn van mijn relatie (bijv. ik stel me voor dat ik over een paar jaar nog steeds met mijn partner samen ben)

1. I want our relationship to last for a very long time
2. I am committed to maintaining my relationship with my partner
3. I would not feel very upset if our relationship were to end in the near future
4. It is likely that I will date someone other than my partner within the next year
5. I feel very attached to our relationship–very strongly linked to my partner
6. I want our relationship to last forever
7. I am oriented toward the long-term future of my relationship (for example, I imagine being with my partner several years from now).

Agreeableness (10-item Subscale from the HEXACO-60; Ashton & Lee, 2009; 1 = *strongly disagree*, 7 = *strongly agree)*

1. Ik heb zelden wrok, zelfs tegenover mensen die me heel veel onrecht hebben aangedaan
2. Mensen vertellen me soms dat ik te kritisch ben naar anderen
3. Mensen vertellen me soms dat ik te eigenwijs ben
4. Mensen denken dat ik iemand ben met een kort lontje
5. Mijn houding tegenover mensen die me slecht hebben behandeld is "vergeven en vergeten".
6. Ik heb de neiging mild te zijn bij het beoordelen van anderen
7. Ik ben meestal vrij flexibel in mijn meningen wanneer mensen het niet met mij eens zijn
8. De meeste mensen hebben de neiging sneller boos te worden dan ik
9. Zelfs als mensen veel fouten maken, zeg ik zelden iets negatiefs
10. Wanneer mensen mij vertellen dat ik fout zit, is mijn eerste reactie om met ze te discussiëren

1. I rarely hold a grudge, even against people who have badly wronged me
2. People sometimes tell me that I am too critical of others
3. People sometimes tell me that I'm too stubborn.
4. People think of me as someone who has a quick temper
5. My attitude toward people who have treated me badly is "forgive and forget."
6. I tend to be lenient in judging other people
7. I am usually quite flexible in my opinions when people disagree with me
8. Most people tend to get angry more quickly than I do.
9. Even when people make a lot of mistakes, I rarely say anything negative
10. When people tell me that I'm wrong, my first reaction is to argue with them.

Relationship Satisfaction at Intake (4-item Subscale; Rusbult, Martz, & Agnew, 1998; 1 = *strongly disagree*, 7 = *strongly agree)*

1. I feel satisfied with our relationship
2. My relationship is much better than others' relationships
3. My relationship is close to ideal
4. Our relationship makes me very happy

5. Ik voel me tevreden met onze relatie
6. Mijn relatie is veel beter dan de relaties van anderen
7. Mijn relatie is dicht bij het ideale
8. Onze relatie maakt mij heel blij

Forgiveness in the Diary (1-item; 1 = *strongly disagree*, 7 = *strongly agree)*

- Today, I forgave my partner quickly

- Vandaag, Ik vergaf mijn partner snel

5. Stroop Task

As with the SC-IAT, the Inquisit script for our Stroop task (Stroop, 1935) was run on Inquisit 4 (Millisecond, 2015) and retrieved and adjusted from the Millisecond library (https://www.millisecond.com/download/library/stroop/).

In this task, participants were sequentially showed color words (i.e., "red", "green", "blue", or "black") written in colors. They were asked to indicate the color of the word (not its meaning) by a key press as fast as they could without making too many errors. More specifically, there were 4 colored words (i.e., in red, green, blue, or black), with 3 different color-stimulus congruencies possible (i.e., congruent, incongruent, control), repeated 7 times in a random order, for a total of 84 trials. To compute Stroop scores, response times below 250ms or above 3,000 were discarded (2.8% of the data), and error responses were eliminated (5.1% of the data). Averaged response times in congruent trials were then subtracted from incongruent trials, with greater scores reflecting greater Stroop interference and, thus, lower executive control.

Table S4. Stroop Task – Stimuli

Color	Translation	Key-response
Red	Rood	D
Green	Groen	F
Blue	Blauw	J
Black	Zwart	K

Table S5. Stroop Task – Trials

Trial Type	Color-Stim Consistency	Repetition	Number of Trials
Congruent	Color word and color presented are the same	7	24
Incongruent	Color word and color presented are the same	7	24
Control	Colored rectangle	7	24

We used a performance-based measure rather than self-report to assess participants' trait executive control because there is convincing evidence showing that these two different types of measures assess different constructs. Indeed, executive control is defined as the cognitive ability to regulate one's behavior, and can be assessed by a range of cognitive tasks (i.e., performance-based measures) that require individuals to engage in attention selection and inhibitory processes (Toplak et al., 2013). In contrast, research has shown that such cognitive ability is dissociated from people's self-reported trait self-control, which refers to their own perceptions of their general capacity to behave according to their goals and standards (Duckworth & Kern, 2011). Indeed, there is evidence showing that self-report measures of self-control reflect people's *motivation* to proactively adopt healthy habits that prevent people to succumb to temptations (Gillebaart & de Ridder, 2015), or to avoid temptations in the first place (Ent et al., 2015), rather than their actual *ability* to use executive control to resist real-life temptations (Grund & Carstens, 2018; Hofmann, Baumeister, et al., 2012).

Consistent with these views, in Study 2, we found no significant association between self-reported self-control and performance-based executive control on the Stroop task, $r(253) = -.03$, 95% CI = [-.15, .09], $p = .666$; thus, corroborating the idea that these two measurement types assess different constructs (Duckworth & Kern, 2011; Toplak et al., 2013). Consistently, self-reported trait self-control did not significantly moderate the effect of implicit partner evaluations on forgiveness (see Table S6).

Table S6. Secondary Results of Multilevel Model Predicting Daily Forgiveness

Predictors	β	*SE*	*t*	*df*	*p*	95% CI
IPE	0.04	0.05	0.81	164.61	.419	[-0.06, 0.14]
Self-Control	0.01	0.05	0.24	153.54	.811	[-0.09, 0.11]
IPE*Self-Control	-0.03	0.05	-0.67	157.26	.502	[-0.14, 0.07]

Note. IPE = implicit partner evaluations (SC-IAT). All predictors were entered at level 2 (i.e., individual level). We standardized all our variables at a grand-mean level to provide standardized coefficients (β) as effect size estimates.

6. Secondary Analyses

As in Study 1, we examined whether the interaction effect between implicit partner evaluations and Stroop scores was possibly driven by non-linear, quadratic effects of our continuous variables (MacCallum & Mar, 1995); again, this was not the case (see Table S7).

Table S7. Secondary Results Controlling for Quadratic Effect (Study 2)

Predictors	β	*SE*	*t*	*df*	*p*	95% CI
IPE	0.06	0.05	1.18	161.13	.241	[-0.04, 0.15]
Stroop	-0.03	0.05	-0.50	166.42	.619	[-0.13, 0.08]
IPE*Stroop	0.14	0.05	2.89	141.97	.004	[0.04, 0.23]
Q(IPE)	0.03	0.04	0.74	130.80	.459	[-0.04, 0.10]
Q(Stroop)	0.04	0.04	1.14	161.57	.258	[-0.03, 0.11]

Note. Results from of a multilevel model predicting daily forgiveness scores. IPE = implicit partner evaluations (SC-IAT); Stroop = Stroop interference; *Q*(IPE) = quadratic effect of implicit partner evaluations; *Q*(Stroop) = quadratic effect of Stroop interference. All predictors were entered at level 2 (i.e., individual level). We standardized all our variables at a grand-mean level to provide standardized coefficients (β) as effect size estimates.

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SUPPLEMENTAL MATERIAL FOR CHAPTER 5

1. Partner Evaluative Priming task (PEPT; McNulty et al., 2013)

In both studies, we used the PEPT (McNulty et al., 2013) to assess participants' positive and negative evaluative associations. This task was run on desktop computers using Inquisit 4. In this task, participants were showed target words in random order, prior which a picture prime was displayed. Past research showed that picture primes offer improved methodological quality and produce more reliable effects than lexical primes (Scinta & Gable, 2007). Participants were required to indicate as rapidly and correctly as possible whether the word displayed on screen was positive (response-key "L") or negative (response-key "A"). Faster reaction times (RTs) to categorize positive (or negative) words following partner primes as compared to neutral primes reflect stronger partner-positive (or -negative) associations and, thus, more positive (or negative) implicitly-assessed partner attitudes. We provide descriptive statistics and reliability indices of the PEPT for each study in Table S1. The Inquisit script that contains all instructions and target words used for the PEPT in the present investigation can be retrieved from: https://osf.io/b5qx6/.

Table S1. Descriptive Statistics and Reliabilities for PEPT in Studies 1-2

	Block 1			Block 2			Split-Half
Measure	***M***	***SD***	***α***	***M***	***SD***	***α***	
Study 1							
Facilitation to pos. words	44.14	131.75	.73	121.32	138.70	.69	.72
Facilitation to neg. words	28.27	142.52	.68	142.52	150.10	.73	.72
Study 2							
Facilitation to pos. words	71.89	159.47	.65	143.66	161.45	.60	.77
Facilitation to neg. words	93.16	167.64	.71	157.41	176.16	.60	.78

Note. Means and *SD*s are in ms and are facilitation scores formed by subtracting RTs following partner primes from RTs following neutral primes; thus, higher scores indicate greater facilitation by partner primes to positive and negative words. Cronbach's alphas are internal consistencies among RTs following primes. Split halves are associations between facilitation scores from Block 1 and Block 2, estimated in a multilevel model with a fixed intercept.

2. Scales

19-item Marital Problems Inventory (Geiss & O'Leary, 1981)

All couples experience some difficulties or differences of opinion in their marriages, even if they are only very minor ones. Listed below are a number of issues that might be difficulties in your marriage. For each issue fill in a bubble to indicate how much it is a source of difficulty or disagreement for you and your spouse.

	Not a Problem 1	2	3	4	5	6	7	8	9	10	Major Problem 11
Children											
Religion	O	O	O	O	O	O	O	O	O	O	O
In-laws, parents, relatives	O	O	O	O	O	O	O	O	O	O	O
Recreation and leisure time	O	O	O	O	O	O	O	O	O	O	O
Communication	O	O	O	O	O	O	O	O	O	O	O
Household management	O	O	O	O	O	O	O	O	O	O	O
Showing affection	O	O	O	O	O	O	O	O	O	O	O
Making decisions	O	O	O	O	O	O	O	O	O	O	O
Friends	O	O	O	O	O	O	O	O	O	O	O
Unrealistic expectations	O	O	O	O	O	O	O	O	O	O	O
Money management	O	O	O	O	O	O	O	O	O	O	O
Sex	O	O	O	O	O	O	O	O	O	O	O
Jealousy	O	O	O	O	O	O	O	O	O	O	O
Solving problems	O	O	O	O	O	O	O	O	O	O	O
Trust	O	O	O	O	O	O	O	O	O	O	O
Independence	O	O	O	O	O	O	O	O	O	O	O
Drugs and alcohol	O	O	O	O	O	O	O	O	O	O	O
Career decisions	O	O	O	O	O	O	O	O	O	O	O
Amount of time spent together	O	O	O	O	O	O	O	O	O	O	O

How willing are you to change your own behaviors, preferences, or goals to resolve any problems in the area?

	Not a Problem 1	2	3	4	5	6	7	8	9	10	Major Problem 11
Children	O	O	O	O	O	O	O	O	O	O	O
Religion	O	O	O	O	O	O	O	O	O	O	O
In-laws, parents, relatives	O	O	O	O	O	O	O	O	O	O	O
Recreation and leisure time	O	O	O	O	O	O	O	O	O	O	O
Communication	O	O	O	O	O	O	O	O	O	O	O
Household management	O	O	O	O	O	O	O	O	O	O	O
Showing affection	O	O	O	O	O	O	O	O	O	O	O
Making decisions	O	O	O	O	O	O	O	O	O	O	O
Friends	O	O	O	O	O	O	O	O	O	O	O
Unrealistic expectations	O	O	O	O	O	O	O	O	O	O	O
Money management	O	O	O	O	O	O	O	O	O	O	O
Sex	O	O	O	O	O	O	O	O	O	O	O
Jealousy	O	O	O	O	O	O	O	O	O	O	O
Solving problems	O	O	O	O	O	O	O	O	O	O	O
Trust	O	O	O	O	O	O	O	O	O	O	O
Independence	O	O	O	O	O	O	O	O	O	O	O
Drugs and alcohol	O	O	O	O	O	O	O	O	O	O	O
Career decisions	O	O	O	O	O	O	O	O	O	O	O
Amount of time spent together	O	O	O	O	O	O	O	O	O	O	O

15-item Semantic Differential (SMD; Osgood et al., 1957)

For each of the following items, fill in the circle (O) that best describes HOW YOU FEEL ABOUT YOUR MARRIAGE. Base your responses on your first impressions and immediate feelings about the item.

	1	2	3	4	5	6	7	
1) INTERESTING	O	O	O	O	O	O	O	BORING*
2) BAD	O	O	O	O	O	O	O	GOOD
3) UNPLEASANT	O	O	O	O	O	O	O	PLEASANT
4) FULL	O	O	O	O	O	O	O	EMPTY*
5) WEAK	O	O	O	O	O	O	O	STRONG
6) SATISFIED	O	O	O	O	O	O	O	DISSATISFIED*
7) LONELY	O	O	O	O	O	O	O	FRIENDLY
8) STURDY	O	O	O	O	O	O	O	FRAGILE*
9) REWARDING	O	O	O	O	O	O	O	DISAPPOINTING*
10) DISCOURAGING	O	O	O	O	O	O	O	HOPEFUL
11) ENJOYABLE	O	O	O	O	O	O	O	MISERABLE*
12) TENSE	O	O	O	O	O	O	O	RELAXED
13) STABLE	O	O	O	O	O	O	O	UNSTABLE*
14) HAPPY	O	O	O	O	O	O	O	SAD*
15) STRESSFUL	O	O	O	O	O	O	O	PEACEFUL

The SMD showed high internal consistency in both studies (at baseline, both αs = .93; at follow-up, α = .97 and .96, respectively). Items with asterisks need to be reverse coded.

6-item Quality of Marriage Index (QMI; Norton, 1983)

Please indicate how well the following statements describe you and your marriage.

	Very Strong DISAGREEMENT						**Very Strong AGREEMENT**
	1	**2**	**3**	**4**	**5**	**6**	**7**
1) We have a good marriage.	O	O	O	O	O	O	O
2) My relationship with my partner is very stable.	O	O	O	O	O	O	O
3) Our marriage is strong.	O	O	O	O	O	O	O
4) My relationship with my partner makes me happy.	O	O	O	O	O	O	O
5) I really feel like part of a team with my partner.	O	O	O	O	O	O	O

6) All things considered, how happy are you in your marriage?

Very UNHAPPY									**Perfectly HAPPY**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	10
O	O	O	O	O	O	O	O	O	O

The QMI showed high internal consistency in both studies (at baseline, α = .93 and .89, respectively; at follow-up, α = .96 and .94, respectively).

3-item Kansas Marital Satisfaction (KMS; Schumm et al., 1986)

	Not at all satisfied						Extremely satisfied
	1	**2**	**3**	**4**	**5**	**6**	**7**
1) How satisfied are you with your partner?	O	O	O	O	O	O	O
2) How satisfied are you with your relationship with your partner?	O	O	O	O	O	O	O
3) How satisfied are you with your marriage?	O	O	O	O	O	O	O

The KMS scale showed high internal consistency in both studies (at baseline, α = .90 and .91, respectively; at follow-up, both αs = .97).

3. Composite Score of Marital Satisfaction

These three scales (i.e., SMD, QMI, KMS) showed high levels of internal consistency and were highly correlated in both studies (at baseline, inter-item correlations ranging from r = .74 to .85 and from .78 to .81, respectively; at follow-up, inter-item correlations ranging from r = .69 to .87 and from .86 to .90, respectively). Thus, we created a composite score of marital satisfaction by a) using Z-standardized individual scores of these three scales in order to have them all in the same metric, and b) averaging these three standardized scores together.

English Summary

Romantic relationships are essential to people's mental and physical health (Proulx et al., 2007; Robles et al., 2014; Sbarra et al., 2011). And yet, despite the numerous benefits they confer, remaining satisfied with a long-term romantic partner is notoriously difficult. In fact, not only do divorce rates hover between 30% and 50% in most industrialized societies (Amato & James, 2010), many spouses who do stay together experience declines in relationship satisfaction over time (Meltzer et al., 2014). For decades, research on couples has attempted to understand the source of relationship decay by explicitly asking people how they evaluate their relationships. Ironically, however, relationship science also indicates that people seem largely indisposed to acknowledge some aspects of their relationships in self-report questionnaires (Fincham & Osborne, 1995), particularly when those are undesirable (Murray, 1999). And, crucially, this appears to considerably undermine our understanding of relationship functioning (Joel et al., 2020). To circumvent those limitations, a growing body of work has started to employ more indirect measurement tools (the so-called '*implicit measures*') to capture people's spontaneous evaluative associations, or gut-feeling reactions, toward their partner (i.e., their *implicit partner evaluations*; Hicks & McNulty, 2019). This work shows that implicit partner evaluations, as assessed by implicit measures, differ quite sharply from self-reported explicit evaluations (Hicks et al., 2020) and predict later relationship quality and stability, even when explicit evaluations do not (Lee et al., 2010; McNulty et al., 2013). To date, however, little is known about the sources of implicit partner evaluations and the reasons why they have such powerful predictive power.

The present dissertation contributes to this growing field of research in many ways by examining how implicit partner evaluations form and affect close relationships in everyday life. First, while little work has focused on the antecedents of implicit partner evaluations, Chapter 2 examines how implicit vs. explicit partner evaluations fluctuate over time and update in response to daily relationship experiences. Second, Chapters 3 and 4 investigate whether and under which conditions implicit partner evaluations influence daily relationship behaviors that are critical for relationship maintenance, such as nonverbal communication and forgiveness. Third, Chapter 5 further extends these findings by documenting the motivational processes through which ambivalence in implicit partner evaluations affect relationship functioning over time. Last, Chapter 6 describes how studying implicit evaluations in close relationship contexts can also invigorate basic implicit social cognition research and inform interventions for society.

In Chapter 2, we examined the temporal dynamics of implicit and explicit partner evaluations in relationship contexts. Prior research indicates that implicit and explicit partner evaluations are weakly associated with one another, and it has been argued that such discrepancy is due to the fact that implicit partner evaluations are more sensitive to relationship rewards and costs that may often be overlooked (due to cognitive limitations) or denied (due to positive motivational biases) when forming explicit partner evaluations. Up until now, however, supporting evidence for this assumption remains scarce. This chapter presents two studies that address this question. Study 2.1 was an in-lab dyadic

interaction study in which we examined temporary changes in implicit and explicit partner evaluations from both partners of romantic couples following a videotaped problem-solving conversation. Study 2.2 was an intensive dyadic daily diary study in which, every day for two weeks, we measured implicit and explicit partner evaluations as well as positive and negative relationship experiences encountered during the day by both couple members. Consistent with dual-process theories of attitude change (Gawronski & Bodenhausen, 2006), we found that compared to explicit, implicit partner evaluations remained more stable over the course of two weeks and showed very weak associations—if any—with concurrent relationship experiences encountered either in the lab or in the field. Rather than covarying with same-day experiences, implicit partner evaluations appeared to be more strongly tied to relationship experiences aggregated over multiple prior days and to highly diagnostic experiences (e.g., break-up). These findings thus suggest that implicit partner evaluations better forecast relationship trajectory not because they are flexible and sensitive indicators of recent relationship experiences, but precisely because they are more stable, less vulnerable to day-to-day swings, and more attuned to the accumulation of relationship experiences over time.

Chapters 3 and 4 investigated whether the long-term implications of implicit partner evaluations for relationship outcomes may rest in their direct influence on relationship behaviors in daily life. According to dual-process theories (Fazio, 1990), implicit evaluations likely orient behavior when opportunity to engage in controlled processing is reduced. From this perspective, we reasoned that implicit partner evaluations should determine behavior (a) that is spontaneous and thus difficult to control, (b) in situations where external factors undermine people's state executive control, or (c) for people who are low in trait executive control (Friese et al., 2008).

In Chapter 3, we examined what type of behavior may be influenced by implicit partner evaluations in close relationships. Specifically, in this chapter, we proposed and tested the hypothesis that implicit partner evaluations would affect spontaneous nonverbal behavior in dyadic interactions and, in turn, influence later relationship outcomes. Research indeed shows that, unlike verbal statements, nonverbal cues are extremely difficult to control (DePaulo, 1992) and yet serve critical functions in interpersonal interactions (Noller, 2006). In an observational study, we videotaped romantic couples while discussing a topic of divergence of interests and coded the nonverbal and verbal behaviors exhibited by both partners according to an objective coding system. As predicted, results revealed that more positive implicit partner evaluations predicted more constructive nonverbal behavior toward the partner, but not more constructive verbal behavior. Constructive nonverbal behavior, in turn, was linked to higher satisfaction with the outcome of the conversation and to increased relationship satisfaction in the following week, even after controlling for verbal behavior. We also tested whether explicit evaluations predicted either type of behavior during the conversation; however, this was not the case.

In Chapter 4, we extended the aforementioned findings by investigating the situations when and the people for whom implicit partner evaluations predict forgiveness—a key

process to maintaining relational harmony in the long run. In fact, romantic partners inevitably hurt each other's feelings over the course of their relationships and, when they do, forgiving the partner's offense is necessary to promote relational and individual well-being (McCullough et a., 2000). In this chapter, we report two studies testing the assumption that implicit partner evaluations predict forgiveness when executive control is low, either as a state (due to situational factors) or as a trait (due to individual dispositions). Consistent with our predictions, Study 4.1 showed that more positive implicit partner evaluations predicted more willingness to forgive the partner in a hypothetical transgression scenario when an experimental manipulation temporarily impaired participants' state executive control (vs. control condition). Likewise, in Study 4.2, more positive implicit partner evaluations predicted more forgiveness toward the partner's real-life offenses in an 8-day daily diary for people with low (vs. high) trait executive control. Further, in both studies, ancillary analyses showed that our findings remained significant when controlling for explicit evaluations and were not accounted for by other personality or relationship variables.

Chapter 5 focused on the implications of implicit ambivalence for relationship functioning. Consistent with the idea that people experience both relational rewards and costs, research shows that they commonly hold both positive and negative implicit partner evaluations; that is, they are implicitly ambivalent, even in the absence of explicit ambivalence (Zayas et al., 2017). Drawing upon ambivalence literature (Petty et al., 2012), we expected that implicit ambivalence would automatically motivate people to make efforts to improve their relationship and thereby solve the source of their ambivalence. We tested this idea across two samples of newlyweds couples. As predicted, multilevel integrative data analyses showed that implicit ambivalence was positively associated with the motivation to make changes in one's behaviors, preferences, or goals in an attempt to solve current marital problems, irrespective of the severity of these problems, their marital satisfaction, and the overall valence of their implicit partner evaluations. Furthermore, we also tested whether such motivational efforts could lead to corresponding changes in the relationship over time. Results revealed that higher motivation to make efforts, in turn, was linked to reduced severity of marital problems as reported by the partner four months later which, consecutively, resulted in elevated marital satisfaction for both spouses. These findings thus indicate that not only the relative difference but also the ambivalence between positive and negative implicit partner evaluations can serve critical functions in close relationships.

Finally, in Chapter 6, we argue that research on attitudes also stands to benefit from studying implicit social cognition in close relationships. While prior research has long examined attitudes toward strangers in artificial laboratory situations, we propose that close relationship contexts offer unique opportunities to study strong attitudes in domains that involve ongoing contact with important others. In fact, in this chapter, we describe how such contexts enable researchers to apply fine-grained, dyadic, longitudinal methodologies that may address long long-lasting questions and current controversies about the nature, the temporal stability, and the predictive validity of implicitly assessed attitudes. Specifically, we review theoretical accounts and empirical evidence demonstrating how implicit partner

evaluations develop from and relate to personal experiences in the relationship, how they can change in a meaningful and reliable fashion over time, and how they can shape judgments and behaviors in the real world that have concrete implications for the fate of the relationship. Further, given the severe turmoil that relationship deterioration creates for adults and children, we also argue that such focus may provide novel insights for developing interventions that can benefit both couples and society.

To conclude, the present dissertation advances our understanding of how implicit partner evaluations form and affect close relationships in everyday life. Using a combination of fined-grained longitudinal, experimental, and observational methods, our findings indicate that implicit partner evaluations remain stable over time, are resistant to day-to-day relationship experiences, and update gradually as relationship experiences accumulate in time. Further, we also found that implicit partner evaluations have important implications for relationship maintenance because, under specific yet prevalent conditions, they determine daily behaviors that are critical for long-term relational well-being, such as nonverbal communication in a problem-solving conversation, forgiveness toward the partner's offense, and behavioral efforts to improve marital problems. Taken together, these findings illustrate the scientific and practical value of integrating research in relationship science and implicit social cognition. In fact, studying implicit partner evaluations in close relationships can help us understand and predict how relationships operate, and identify new ways to intervene on such evaluations to improve relationship functioning. Further, it offers a unique opportunity to invigorate implicit social cognition research by examining how attitudes are formed through ongoing contact with a significant other and how they affect consequential behaviors in the real world. While relationship research has only started to study automatic processes, with this dissertation I hope to have contributed to this growing field, to have shown the key role of implicit partner evaluations in relational contexts, and to have paved the way for further integration between relationship science and implicit social cognition research.

Nederlandse Samenvatting (Dutch Summary)

Romantische relaties zijn essentieel voor de mentale en fysieke gezondheid van mensen (Proulx et al., 2007; Robles et al., 2014; Sbarra et al., 2011). En toch is het, ondanks de vele voordelen die partners bieden, algemeen bekend dat het moeilijk is om tevreden te blijven met een romantische partner op de lange-termijn. Niet alleen schommelen de echtscheidingscijfers in de meeste geïndustrialiseerde samenlevingen tussen de 30% en 50% (Amato & James, 2010), ook veel echtgenoten die wel bij elkaar blijven ervaren in de loop van de tijd een afname van de relatietevredenheid (Meltzer et al., 2014). Decennia lang heeft onderzoek naar koppels geprobeerd de bron van relatieverval te begrijpen door mensen expliciet te vragen hoe ze hun relaties evalueren. Ironisch genoeg geeft de relatiewetenschap echter ook aan dat mensen in zelfrapportage vragenlijsten grotendeels niet geneigd lijken om bepaalde aspecten van hun relaties te erkennen (Fincham & Osborne, 1995), vooral wanneer die ongewenst zijn (Murray, 1999). En dit lijkt ons begrip van relatie functioneren juist aanzienlijk te ondermijnen (Joel et al., 2020). Om deze beperkingen te omzeilen, is een groeiend aantal onderzoeken begonnen met het gebruiken van meer indirecte meetinstrumenten (de zogenaamde '*impliciete metingen*') om de spontane evaluatieve associaties of onderbuikgevoelens van mensen ten opzichte van hun partner vast te leggen (d.w.z. hun *impliciete partnerevaluaties*; Hicks & McNulty, 2019). Dit werk laat zien dat impliciete partnerevaluaties, vastgesteld door middel van impliciete metingen, vrij sterk verschillen van zelf gerapporteerde expliciete evaluaties (Hicks et al., 2020) en latere relatiekwaliteit en –stabiliteit voorspellen, zelfs wanneer expliciete evaluaties dat niet doen (Lee et al., 2010; McNulty et al., 2013). Tot op heden is er echter weinig bekend over de bronnen van impliciete partnerevaluaties en de redenen waarom deze zo'n sterke voorspellende waarde hebben.

Het huidige proefschrift draagt op vele manieren bij aan dit groeiende onderzoeksveld door te onderzoeken hoe impliciete partnerevaluaties worden gevormd en hoe zij hechte relaties beïnvloeden in het dagelijks leven. Ten eerste, terwijl weinig werk zich heeft gericht op de antecedenten van impliciete partnerevaluaties, onderzoekt Hoofdstuk 2 hoe impliciete versus expliciete partnerevaluaties fluctueren in de loop van de tijd en hoe ze worden aangepast naar aanleiding van dagelijkse relatie-ervaringen. Ten tweede onderzoeken Hoofdstuk 3 en 4 of en onder welke voorwaarden impliciete partnerevaluaties invloed hebben op dagelijkse relatiegedraging die cruciaal zijn voor het onderhouden van relaties, zoals non-verbale communicatie en vergeving. Ten derde breidt Hoofdstuk 5 deze bevindingen verder uit door het documenteren van motivationele processen waardoor ambivalentie in impliciete partnerevaluaties het functioneren van de relatie in de loop van de tijd beïnvloedt. Ten slotte beschrijft Hoofdstuk 6 hoe het bestuderen van impliciete evaluaties in hechte relatie contexten ook fundamenteel onderzoek naar impliciete sociale cognitie kan stimuleren en informatie kan bieden voor maatschappelijke interventies.

In Hoofdstuk 2 hebben we de temporele dynamiek van impliciete en expliciete partnerevaluaties in relatie contexten onderzocht. Eerder onderzoek geeft aan dat impliciete en expliciete partnerevaluaties zwak met elkaar in verband staan, en er is gesteld dat een dergelijke discrepantie te wijten is aan het feit dat impliciete partnerevaluaties gevoeliger

zijn voor relatiebeloningen en -kosten die vaak over het hoofd worden gezien (vanwege cognitieve beperkingen) of worden ontkend (vanwege positieve motiverende vooroordelen) wanneer expliciete partnerevaluaties worden gevormd. Tot nu toe is het bewijs voor deze veronderstelling echter nog steeds schaars. In dit hoofdstuk worden twee studies gepresenteerd die deze vraag behandelen. Studie 2.1 was een dyadisch interactieonderzoek in het lab waarin we tijdelijke veranderingen in impliciete en expliciete partnerevaluaties van beide partners binnen romantische koppels onderzochten, naar aanleiding van een op video opgenomen probleemoplossend gesprek. Studie 2.2 was een intensief dyadisch dagboekonderzoek waarin we gedurende twee weken elke dag impliciete en expliciete partnerevaluaties hebben gemeten, evenals positieve en negatieve relatie-ervaringen die beide partners binnen het koppel gedurende de dag hadden opgedaan. In overeenstemming met de dual-process theorieën van attitudeverandering (Gawronski & Bodenhausen, 2006) vonden we dat, vergeleken met expliciete partnerevaluaties, impliciete partnerevaluaties stabieler bleven gedurende de twee weken en zeer zwakke associaties vertoonden—als deze er überhaupt was—met gelijktijdige relatie-ervaringen in het lab of in het veld. De impliciete partnerevaluaties bleken niet zozeer te zijn gebaseerd op ervaringen van dezelfde dag, maar op ervaringen van meerdere voorafgaande dagen en op hoog-diagnostische ervaringen (bijv. het uitgaan van een relatie). Deze bevindingen suggereren dus dat impliciete partnerevaluaties het relatietraject beter voorspellen, niet omdat het flexibele en gevoelige indicatoren van recente relatie-ervaringen zijn, maar juist omdat ze stabieler zijn, minder kwetsbaar voor dagelijkse schommelingen en meer afgestemd op de accumulatie van relatie-ervaringen in de loop van de tijd.

Hoofdstukken 3 en 4 onderzoeken of de lange termijngevolgen van impliciete partnerevaluaties voor relatie-uitkomsten zouden kunnen berusten op hun directe invloed op relatiegedrag in het dagelijks leven. Volgens de dual-process theorieën (Fazio, 1990) sturen impliciete evaluaties waarschijnlijk gedrag wanneer de kans op gecontroleerde verwerking is verminderd. Vanuit dit perspectief redeneerden we dat impliciete partnerevaluaties gedrag zouden moeten bepalen (a) dat spontaan is en dus moeilijk te controleren, (b) in situaties waar externe factoren de staat van de executieve controle van mensen ondermijnen, of (c) voor mensen die laag scoren op de eigenschap executieve controle (Friese et al., 2008).

In Hoofdstuk 3 hebben we onderzocht welk soort gedrag kan worden beïnvloed door impliciete partnerevaluaties in hechte relaties. In dit hoofdstuk hebben we specifiek de hypothese opgesteld en getest dat impliciete partnerevaluaties spontaan non-verbaal gedrag in dyadische interacties kunnen beïnvloeden en daardoor ook latere relatie-uitkomsten beïnvloeden. Onderzoek toont inderdaad aan dat non-verbale signalen, in tegenstelling tot verbale uitspraken, uiterst moeilijk te controleren zijn (DePaulo, 1992) terwijl zij kritieke functies vervullen in interpersoonlijke interacties (Noller, 2006). In een observationeel onderzoek hebben we romantische koppels gefilmd terwijl ze een onderwerp van uiteenlopende belangen bespraken en hebben we het non-verbale en verbale gedrag van beide partners gecodeerd volgens een objectief coderingssysteem. Zoals voorspeld toonden de resultaten aan dat meer positieve impliciete partnerevaluaties meer constructief non-

verbaal gedrag, maar niet meer constructief verbaal gedrag, ten opzichte van de partner voorspelden. Constructief non-verbaal gedrag was op zijn beurt weer gekoppeld aan hogere tevredenheid over de uitkomst van het gesprek en aan hogere relatietevredenheid in de daaropvolgende week, zelfs na het controleren voor verbaal gedrag. We hebben ook getest of expliciete evaluaties beide soorten gedrag tijdens het gesprek voorspelden; dit was echter niet het geval.

In Hoofdstuk 4 hebben we de bovengenoemde bevindingen uitgebreid door te onderzoeken in welke situaties en voor welke mensen impliciete partnerevaluaties vergevingsgezindheid voorspellen—een essentieel proces om relationele harmonie op de lange termijn te behouden. Het is namelijk onvermijdelijk dat romantische partners elkaars gevoelens kwetsen in de loop van hun relaties, en wanneer ze dat doen is het vergeven van hun overtreding noodzakelijk om relationeel en individueel welzijn te bevorderen (McCullough et al., 2000). In dit hoofdstuk rapporteren we twee studies die de veronderstelling testen dat impliciete partnerevaluaties vergevingsgezindheid voorspellen wanneer executieve controle laag is, hetzij als een staat (als gevolg van situationele factoren) of als een eigenschap (als gevolg van individuele disposities). In overeenstemming met onze voorspellingen toonde Studie 4.1 aan dat meer positieve impliciete partnerevaluaties voorspellend zijn voor een hogere bereidheid om de partner te vergeven in een hypothetisch overtredingsscenario wanneer een experimentele manipulatie de staat van de executieve controle van de deelnemers tijdelijk verminderde (versus een controleconditie). In Studie 4.2, een 8-daagse dagboekstudie, voorspelden positievere impliciete partnerevaluaties eveneens meer vergevingsgezindheid ten opzichte van echte overtredingen van de partner in mensen met een lage (versus een hoge) dispositie voor executieve controle. Verder bleek uit beide studies dat onze bevindingen significant bleven na het controleren voor expliciete evaluaties en niet verklaard konden worden door andere persoonlijkheids- of relatievariabelen.

Hoofdstuk 5 richtte zich op de implicaties van impliciete ambivalentie voor relatie functioneren. In overeenstemming met het idee dat mensen zowel relationele beloningen als kosten ervaren, toont onderzoek aan dat ze vaak zowel positieve als negatieve impliciete partnerevaluaties hebben; dat wil zeggen dat ze impliciet ambivalent zijn, zelfs als er geen expliciete ambivalentie is (Zayas et al., 2017). Op basis van de ambivalentieliteratuur (Petty et al., 2012) verwachtten we dat impliciete ambivalentie mensen automatisch zou motiveren om zich in te spannen om hun relatie te verbeteren en daarmee de bron van hun ambivalentie op te lossen. We hebben dit idee getest in twee samples van pasgetrouwde koppels. Zoals voorspeld toonden multi-level integratieve data analyses aan dat impliciete ambivalentie positief samenhangt met de motivatie om veranderingen in iemands eigen gedrag, voorkeuren of doelen aan te brengen in een poging om de huidige huwelijksproblemen op te lossen, ongeacht de ernst van deze problemen, huwelijkstevredenheid en de algehele valentie van hun impliciete partnerevaluaties. Verder hebben we ook getest of dergelijke motiverende inspanningen kunnen leiden tot overeenkomstige veranderingen in de relatie in de loop van de tijd. Uit de resultaten bleek dat een hogere motivatie om inspanningen te

leveren op zijn beurt verband hield met een verminderde ernst van de huwelijksproblemen, zoals gerapporteerd door de partner vier maanden later, wat vervolgens resulteerde in een verhoogde huwelijkstevredenheid voor beide echtgenoten. Deze bevindingen geven dus aan dat niet alleen het relatieve verschil, maar ook de ambivalentie tussen positieve en negatieve impliciete partnerevaluaties kritieke functies in hechte relaties kunnen dienen.

Tot slot stellen we in Hoofdstuk 6 dat onderzoek naar attitudes ook baat kan hebben bij het bestuderen van impliciete sociale cognitie in hechte relaties. Hoewel voorgaand onderzoek al lange tijd de attitudes ten opzichte van vreemden in kunstmatige laboratoriumsituaties heeft onderzocht, stellen we voor dat hechte relatie contexten unieke mogelijkheden bieden om sterke attitudes te bestuderen in domeinen die voortdurend contact met belangrijke anderen behelzen. In dit hoofdstuk beschrijven we hoe dergelijke contexten onderzoekers in staat stellen om gedetailleerde, dyadische, longitudinale methoden toe te passen die langdurige vragen en huidige controverses over de aard, de temporele stabiliteit en de voorspellende validiteit van impliciet gemeten attitudes kunnen adresseren. In het bijzonder bespreken we theoretische verslagen en empirisch bewijs dat aantoont hoe impliciete partnerevaluaties zich ontwikkelen vanuit, en verband houden met, persoonlijke ervaringen in de relatie, hoe ze op een zinvolle en betrouwbare manier kunnen veranderen in de loop van de tijd en hoe ze oordelen en gedragingen in de echte wereld kunnen vormgeven die concrete implicaties hebben voor het lot van de relatie. Verder stellen we ook dat, gezien de ernstige onrust die verslechtering van de relatie met zich meebrengt voor volwassenen en kinderen, een dergelijke focus nieuwe inzichten kan opleveren voor het ontwikkelen van interventies waar zowel koppels als de maatschappij baat bij hebben.

Concluderend bevordert het huidige proefschrift ons begrip van hoe impliciete partnerevaluaties worden gevormd en het dagelijks leven beïnvloeden in hechte relaties. Met een combinatie van gedetailleerde, longitudinale, experimentele en observationele methoden geven onze bevindingen aan dat impliciete partnerevaluaties stabiel blijven in de loop van de tijd, resistent zijn tegen dagelijkse relatie-ervaringen, en geleidelijk worden bijgewerkt naarmate de relatie-ervaringen zich in de tijd opstapelen. Verder vonden we dat impliciete partnerevaluaties belangrijke implicaties hebben voor het onderhouden van een relatie, omdat ze onder specifieke, maar veelvoorkomende, omstandigheden dagelijkse gedragingen bepalen die cruciaal zijn voor lange-termijn relatie welzijn, zoals non-verbale communicatie in een probleemoplossend gesprek, vergeving jegens de overtreding van de partner en gedragsmatige inspanningen om huwelijksproblemen te verbeteren. Samen illustreren deze bevindingen de wetenschappelijke en praktische waarde van het integreren van relatiewetenschap en impliciete sociale cognitie. Het bestuderen van impliciete partnerevaluaties in hechte relaties kan ons namelijk helpen bij het begrijpen en voorspellen van hoe relaties werken, en het identificeren van nieuwe manieren om in te grijpen in zulke evaluaties om zo relatie functioneren te verbeteren. Het biedt ook een unieke kans om fundamenteel impliciet sociaal cognitie-onderzoek te stimuleren door te onderzoeken hoe attitudes worden gevormd in voortdurend contact met een partner en hoe ze belangrijke gedragingen in het echte leven beïnvloeden. Hoewel relatieonderzoek

pas recentelijk is begonnen met het bestuderen van automatische evaluatieprocessen, hoop ik met dit proefschrift een bijdrage te hebben geleverd aan dit groeiende veld, de cruciale rol van impliciete partnerevaluaties in relationele contexten te hebben aangetoond, en de weg te hebben vrijgemaakt voor verdere integratie tussen relatiewetenschap en impliciet sociaal cognitie-onderzoek.

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Ruddy Faure
July, 2021

Curriculum Vitae

BIOGRAPHY

Ruddy Faure was born on February 20th 1992 (on '*a sunny Thursday*' as his lovely grandma likes to recall) in Poitiers, France. Ever since he can remember, Ruddy has always shown a genuine interest in understanding why people behave the way they do. In 2010, he started to study Psychology for his Bachelor degree at the University of Poitiers, where he soon discovered an ever-growing passion for research in social psychology, and one that would steer the remaining of his education. In 2013, he decided to go abroad for a year as an Erasmus student to get rid of his French accent and benefit from the international Psychology program offered by Radboud University in Nijmegen, the Netherlands. Upon his return in France, he was accepted in a Research Master program in Psychological Sciences at the University of Poitiers, where he became fascinated by research in implicit social cognition and how subtle environmental cues and mental processes can shape intergroup relations. In 2016, he was offered a PhD position at the Vrije Universiteit Amsterdam, back in the Netherlands, with Francesca Righetti and Paul Van Lange, and in collaboration with Wilhelm Hofmann from the University of Cologne (and then from Rhur University Bochum), Germany. During his PhD, Ruddy applied implicit social cognition research to interpersonal relations, which resulted in the present dissertation. He also visited Jim McNulty's lab at Florida State University, USA, as part of a 4-month research visit in fall 2018. Currently Ruddy continues his work as an Assistant Professor in Social and Organizational Psychology at the Behavioural Science Institute from Radboud University, back in Nijmegen, where it all started. He recently was awarded a Global Individual Fellowship from the Marie Skłodowska-Curie Action program to fund a 3-year research project in joint collaboration with Radboud University and Florida State University to further investigate the role of automatic processes in close relationships.

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